ARCHIVES OF OPHTHALMOLOGY.

PARINAUD'S CONJUNCTIVITIS; A MYCOTIC DISEASE DUE TO A HITHERTO UNDESCRIBED FILAMENTOUS ORGANISM.[1]

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(*With four illustrations on Text-Plates VI. and VII.*)

IN 1889 Parinaud described a rare conjunctival disease characterized by the occurrence of peculiar granulations, springing usually from one of the retrotarsal folds, and associated with inflammatory enlargement of the preauricular gland or other regional lymphatic glands. In some cases there is moderate constitutional reaction evidenced by chills and fever. The affection is almost invariably confined to one eye, the cornea is never attacked by the process, and recovery takes place within a few weeks to six months. The affected glands occasionally break down. Within recent years numerous cases of the disease have been reported, and although it is thought to be infectious in origin the specific microörganism has hitherto escaped detection. Animal inoculations have given uniformly negative results. Parinaud believed that the disease was transferred from animals to man, but his evidence for this view was insufficient and subsequent observers have failed to confirm it.

In 1904 G. S. Derby and I reported a case of the disease in which I had made out certain histological features not previously recognized that we believed differed from those of any

[1] Read before the New England Ophthalmological Society, April 8, 1913.

other ocular disease.[1] We therefore felt justified in concluding that the histological character of the lesions in Parinaud's conjunctivitis was distinctive of this disease alone. In the following year we reported a second case[2] in which I had found the histological lesions essentially identical with those of the previous case. Since then, although numerous cases of Parinaud's conjunctivitis have been examined, so far as I know only one observer, namely Bernheimer,[3] has fully confirmed my findings. Simultaneously with Bernheimer, Hoor[4] published an elaborate communication on Parinaud's conjunctivitis and reported a case of his own in which the lesions differed histologically from those described by me. Judging by the illustrations of the lesions, I am certain that this case was not one of Parinaud's conjunctivitis. Nevertheless, this paper has attracted wide attention and no doubt has been in large part responsible for the opinion that now seems to prevail that there is nothing characteristic in the histology of Parinaud's conjunctivitis.

More recently a number of observers have reported cases of conjunctival tuberculosis which they believed proved that Parinaud's conjunctivitis was in reality due to tuberculosis. If these observers had shown that their cases possessed the characteristic histological features of Parinaud's conjunctivitis, their contention would merit consideration. But since they did not show this, their cases simply serve to illustrate the fact that certain types of conjunctival tuberculosis may readily be mistaken for Parinaud's conjunctivitis, a fact pointed out by Parinaud and emphasized by Derby and myself in our first paper on the subject.

Including the two cases previously reported with Dr. Derby, I have now examined histologically twelve cases of Parinaud's

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[1] VERHOEFF and DERBY. "Parinaud's Conjunctivitis." ARCHIVES OF OPHTHALMOLOGY, 1904, vol. xxxiii., p. 389.

[2] VERHOEFF and DERBY. "Die pathologische Histologie der Parinaudschen Conjunctivitis." *Klinische Monatsblätter für Augenheilkunde*, 1905, vol. xliii.

[3] ST. BERNHEIMER. "Ein Beitrag zu Parinaud's Konjunktivitis." *Klinische Monatsblätter für Augenheilkunde*, 1906, vol. xliv., p. 323.

[4] HOOR. "Die Parinaudsche Konjunktivitis." *Klinische Monatsblätter für Augenheilkunde*, 1906, vol. xliv., p 289.

conjunctivitis.[1] Two of these were cases of Dr. P. S. Smyth, to whom I here desire to express my obligation. The remaining cases were all seen by me personally at the Massachusetts Charitable Eye and Ear Infirmary. Clinically these cases presented no exceptional features. Each was monocular and showed conjunctival granulations with smaller or larger white areas on their surfaces (areas of cell necrosis) and enlargement of the preauricular lymphatic gland. Marked improvement followed excision of the granulations in all cases, showing that this is the most efficient treatment. In no case seen by me did the gland actually break down so that I could examine its contents. No history strongly suggestive of an animal origin for the disease could be obtained. In one case the patient stated that he had been struck in the affected eye by a grapevine three days before the first ocular symptoms and four days before the enlargement of the preauricular gland. This suggests the possibility of plants as sources for the infection, but the time elapsing after the injury was so short that the latter may have been only a coincidence.

Histologically all of these cases are so similar to each other and to the two cases previously reported that a detailed description for each is unnecessary. The characteristic feature is the occurrence of focal areas, varying in size and shape, infiltrated with endothelial phagocytes in various stages of necrosis. These endothelial cells are not packed close together and united with each other as in tuberculosis, but are discrete. The necrosis bears no resemblance to the caseation of tuberculosis, involving the cells alone. There is a relatively small proportion of lymphoid and plasma cells in the areas, but almost no pus cells. Owing to the fragmentation of the nuclei many of the cells at first glance might be mistaken for pus cells. Special staining usually shows a small amount of fibrin in the areas. Usually the areas are situated just beneath the epithelium, but they also occur deeper down. Generally they are about .3*mm* to .5*mm* in diameter, but

[1] It may be of interest to note that during the same period of time I examined three cases of conjunctival tuberculosis. One of these was histologically atypical but did not resemble Parinaud's conjunctivitis. The diagnosis was confirmed by finding tubercle bacilli in sections, and also by animal inoculation.

occasionally are very much larger than this. In some cases many sections must be examined before they are found. The neighboring lymph spaces are distended with cells and often contain numerous endothelial phagocytes filled with cell debris. Surrounding the areas of cell necrosis the tissue is densely infiltrated with plasma cells; lymphocytes, eosinophiles, and mast cells occurring only in small numbers. There is also formation of ordinary granulation tissue, which involves especially the areas of cell necrosis, the amount depending evidently on the duration of the process.

In two of the cases there was some hyperplasia of lymph follicles in the vicinity of the lesions. The germinal centers of these follicles should not be mistaken for areas of cell necrosis.

Thus each of these twelve cases presented not only the clinical features of Parinaud's conjunctivitis but also the characteristic histological lesions previously described by me. This evidence is sufficient to prove that Parinaud's conjunctivitis is a distinct entity. Recently, however, I have demonstrated in the areas of cell necrosis the microörganisms described below and hence placed the significance of these areas beyond any doubt.

THE SPECIFIC MICROÖRGANISM.

The tissue from the most recent case examined by me (a case of Dr. P. S. Smyth) had been fixed in 10% formalin. Sections of it stained in hematoxylin and eosin showed the typical picture of Parinaud's conjunctivitis just described. Sections stained in carbol-thionin showed numerous bluish masses in the tissue that could readily be seen with a low magnification. With an oil immersion lens and strong daylight illumination the masses could with difficulty be resolved into conglomerations of filaments with dots. Having convinced myself that I was dealing with a microörganism, I investigated the material from my previous cases and found the same microörganism in all but one of them. In ten cases it was found in sections. The best specimens were obtained by restaining sections that had originally been stained in hematoxylin and eosin and mounted in balsam. It was in

this way possible to select sections that contained well-marked areas of cell necrosis. In one case in which the microörganism was not found in sections, it was demonstrated in tissue scrapings. In the one case in which it was not demonstrated, the material was insufficient for the purpose.

TECHNIQUE.

Fixation: The best results are obtained after fixation in Zenker's fluid. Formalin fixation gives inconstant results.

Examination of tissue scrapings: The microörganism may be demonstrated satisfactorily by this method. The hardened tissue is placed in absolute alcohol overnight. It is then placed on a cover slip kept moistened with absolute alcohol and its cut surface scraped with a knife. The scrapings are allowed to dry on the cover slip to which all but the largest particles will adhere during the subsequent staining. (Scrapings dried down from water will not thus adhere.) The staining is the same as for sections.

Staining: In sections stained in hematoxylin and eosin, by the ordinary Gram stain, or by the tubercle bacillus method, the microörganism is invisible.

Carbol-thionin: This is fairly satisfactory after formalin fixation, but the results are far inferior to those obtained with the modified Gram method given below. Sections are first stained in eosin and then in a freshly mixed carbol-thionin solution[1] for thirty minutes. Differentiation in 95% alcohol. Oil of origanum. Xylol. Xylol-balsam.

Wright's modification of Leishman's stain. This stains the microörganism so that it can be recognized.

Modified Gram stain: The results obtained by this method leave little to be desired. The essential difference between it and the ordinary Gram stain lies in the preliminary treatment of the sections with xylol-balsam. The use of chloroform for differentiation, which was suggested to me by Dr. William H. Smith, is important for bringing out the granules in the microörganism. Paraffine sections are preferable, but I have obtained satisfactory results also with celloidin sections. The sections are first brought into xylol-balsam in the usual way, where they remain for five minutes or longer. If the sections are already mounted in balsam it is simply necessary to remove the cover slips by the aid of heat. They are then treated rapidly with successive applications of xylol, chloroform, 95% alcohol,

[1] This is prepared in the same proportions as my carbol-fuchsin solution. ("An Improved Carbol-Fuchsin Solution," *Journal A. M. A.*, May 4, 1912, p. 1355.)

and water. In this way the balsam is incompletely removed. They are then stained as follows.

Aniline gentian violet, 5 minutes. Water.

Lugol's solution (1:2:100), 30 seconds. Water.

95% alcohol until excess of color is removed, about one minute.

Chloroform to differentiate and dehydrate, about 10 seconds.

Wash thoroughly in xylol. Xylol-balsam.

Remove balsam as before and repeat staining process.

This method sometimes stains fibrin, but after the characteristic appearance of the microörganism is once seen there is no danger of confusing it with fibrin.

In all cases the microörganisms occur in irregular masses measuring from 10 to 60 micra in diameters (Fig. 2), but isolated individuals are also seen. At first glance the masses may appear to consist of minute dots, but careful examination with an oil immersion lens shows that they are composed of filaments. The latter seem to have no definite arrangement but are simply intertwined about each other. The individual filament is extremely delicate, stains faintly, and has single contours. It may be apparently straight or more often irregularly curved. Sometimes it is more than once sharply bent almost at right angles. At almost regular intervals along the filament round dots occur which stain intensely by the modified Gram method (Figs. 3 and 4). These are never exactly centered in the axis of the filament but project noticeably above its surface. The dots are seldom all of the same size on one filament, the largest having a diameter a little greater than that of the filament itself. Usually they are close together, at intervals of about three or four of their diameters, but occasionally they are far apart. In thickness the filaments are usually about .33μ, that is, about the thickness of the influenza bacillus, but individuals half this size are occasionally seen, especially in tissue scrapings. In sections the filaments seldom appear very long, usually 3 to 10 micra, due no doubt to their quickly passing out of the plane of the section. In the tissue scrapings, however, filaments 30 micra in length may be seen. Some of the long filaments appear either to become thinner or to stain less intensely towards their ends.

Except in one case the microörganisms are found only in or within the close vicinity of well-marked areas of cell necrosis. In this case, which was evidently an early one, numerous masses can in addition be seen in the superficial lymph spaces, and are especially prominent just beneath the epithelium (Fig. 1), where, as I have pointed out, the areas of cell necrosis usually occur. Such masses are undoubtedly the starting-points for these areas, for all the stages in the formation of the latter can be made out, beginning with the invasion of a mass of microörganisms by a few endothelial cells. Thus this case is alone sufficient to exclude the possibility of the microörganisms being secondary invaders. The predilection of the microörganisms for lymph spaces explains the early involvement of the regional lymph glands in this disease.

CONCLUSIONS.

In eleven out of twelve consecutive cases, each having the clinical features described by Parinaud, and each presenting essentially the same characteristic histological picture, a minute filamentous microörganism was found. The absence of any other demonstrable microörganisms in the lesions, the unusual character of the microörganisms found, their great abundance, and the fact that they were so situated as to explain the lesions, leave no reasonable doubt that they were the cause of the disease. Their occurrence in the areas of cell necrosis previously pointed out by me confirms the diagnostic importance of these areas.

Since no branching of the filaments could be made out, the microörganism may for the present be classed as a leptothrix. So far as I can ascertain, no similar microörganism pathogenic for man has previously been described. Now that its morphology in the tissues and suitable methods for staining it are known, its cultivation on artificial media should soon be accomplished. The experimental production of the disease should also again be attempted, monkeys preferably being selected for the purpose.

HYPOPHYSIS DISEASE (FROM THE OPHTHALMOLOGICAL STANDPOINT), WITH A REPORT OF TWO CASES.

By EMORY HILL, M.D., Chicago.

(With four line cuts in the text.)

I. ANATOMY AND PHYSIOLOGY OF HYPOPHYSIS. CLASSIFICATION OF SECRETORY DISORDERS. II. CASE REPORTS AND INTERPRETATIONS. III. REVIEW OF LITERATURE OF EYE SYMPTOMS OF HYPOPHYSIS DISEASE.

I. *Anatomy and Physiology of Hypophysis. Classification of Secretory Disorders.*

UHTHOFF[1] has well said that temporal hemianopsia and amaurosis were the striking symptoms on which the diagnosis of pituitary tumors depended in the preophthalmoscopic days, and the recognition of a more extended symptomatology necessarily awaited the era of more exact diagnostic methods. In recent years we have come to regard hypophysis disease as not infrequent, and to bear in mind the possibility of such disease when confronted by obscure cases of exophthalmos, ocular-muscle palsies, optic-nerve disease, various visual-field limitations, and evidence of general intracranial pressure.

The volume of experimental work on the hypophysis done in the past decade has increased our knowledge of this obscure organ as one of the series of ductless glands concerned in the elaboration of internal secretions, and some fairly definite

[1] "Augensymptome bei den Hypophysis-Affektionen und der Akromegalie," *Transactions 16th Int. Med. Congress*, Budapest, 1910.

conclusions have been established, although many of the questions raised in the course of such experimentation are still in dispute. The recent work of Cushing[1] presents, with dramatic interest, the studies of the Johns Hopkins laboratories and of other researches, bringing up to date the status of this line of investigation, and shows abundant reason for the hope that we shall eventually possess information of very practical sort on which to base an early recognition of perversions of hypophysis secretion and effectual treatment therefor.

At the risk of being somewhat dogmatic for the sake of conciseness, one may venture the following résumé[2]: The hypophysial vesicle is formed by an evagination of the mucous membrane of the buccal cavity (ectoderm) which joins with a projection from the floor of the third ventricle. The former becomes the pars anterior, the latter the pars posterior (nervosa). The epithelium of this projection is differentiated from the anterior epithelium to form the pars intermedia, the cavity of the original vesicle remaining as a cleft separating the pars anterior from the pars intermedia.

The anterior lobe is characterized by two kinds of cell, the chromophiles (eosinophiles) which predominate when the gland is hyperfunctioning, and the chromophobes which predominate when the gland is hypofunctioning. It is probable that the secretion of the anterior lobe is discharged into the neighboring thin-walled venous sinuses.

The pars intermedia constitutes an epithelial investment for the pars posterior, having a tubular arrangement of cells which invade the nervous tissue extending nearly to the infundibular canal in man. These cells secrete a colloid substance comparable to that found in the thyroid gland.

The pars nervosa has no true nerve cells but ependymal and neuroglial tissue loosely interlaced. Islands of undifferentiated mouth epithelium (inclusions) are found upon the surface of the posterior lobe. This lobe discharges its secretion into the cerebro-spinal fluid.

The anterior lobe is essential to life, its removal resulting

[1] *The Pituitary Body and its Disorders*, 1912

[2] Taken from Cushing's and Dean Lewis's writings (*Transactions American Academy of Ophthalmology and Oto-Laryngology*, 1911).

in death from cachexia. Injection of anterior lobe extract causes some pressor effect on the circulation (perhaps due to traces of the pars intermedia which possesses definite pressor qualities). Undersecretion results in a lowering of the body temperature.

Acute overactivity of the posterior lobe results in a rise of blood pressure with slowing and strengthening of the heart beat, diuresis (due to stimulation of the renal epithelium), uterine contraction, dilatation of the pupils, increased carbohydrate assimilation (lowered tolerance), and a galactagogue action. Chronic oversecretion produces emaciation. Undersecretion causes an increased carbohydrate tolerance. Cushing[1] believes that "normal posterior lobe activity is essential to effective carbohydrate metabolism." While the posterior lobe is concerned especially with processes of metabolism, the anterior lobe is concerned with skeletal growth.

It has not yet been possible to reproduce the symptoms of pituitary glandular hypertrophy by feeding with gland extracts. The effects of undersecretion of the whole gland, however, have been observed after partial hypophysectomy. They embrace adiposity; nutritional changes in the skin and its appendages; disturbance of carbohydrate metabolism, body temperature, growth, and renal secretion, with sexual inactivity or atrophy; and modifications in most of the other ductless glands. The adiposity is generalized; the skin becomes dense, dry, and less movable; the hair becomes bristly and falls out; the temperature is subnormal; mental dulness arises, with irritability; and there is diminished sensibility to pain.

Considering the numerous alterations possible as a result of hyper- and hypo-secretion of each of the lobes, and the coincidence of overgrowth and overfunction of one lobe with pressure atrophy of the other, we readily see that the symptom-complex in a given case may be exceedingly involved and difficult to explain by reference to the inexact experimental conclusions at present arrived at. The entire question of the relative activities of the various members of the ductless gland series; "the pluri-glandular syndrome," so-called; the normal hypertrophy of the hypophysis at puberty and during

[1] *The Pituitary Body and its Disorders*, 1912.

pregnancy; the therapeutic value of pituitary extract in menstrual disorders and in labor; these and many other questions are of great interest, but scarcely germane to the present discussion. The likelihood of pressure effects upon the hypophysis from brain lesions elsewhere, either impairing hypophysial function or preventing the escape of normally elaborated hypophysial secretion, still further complicates the interpretation of symptoms.

The general term "dyspituitarism" covers a large group of cases in which neither hypersecretion nor hyposecretion alone serves to explain the phenomena present. However, two large groups may be identified in which the predominating factors are hyperpituitarism and hypopituitarism. To the former belong the cases of gigantism and acromegaly, general overgrowth of bony framework occurring when the glandular overactivity begins in childhood; overgrowth of the acral parts characteristic of acromegaly when oversecretion is delayed until epiphyseal union has occurred (after puberty). Excessive multiplication of the eosinophile cells of the pars anterior is characteristic of this group. Hypopituitarism is best illustrated in the Fröhlich syndrome, or "dystrophia adiposo-genitalis" of Bartels, a condition of generalized adiposity with delayed development of the genital organs, scant pubic and axillary hair, dry skin, and polyuria; the so-called secondary sexual characteristics failing to develop. When the disease begins in adult life there are retrogressive changes (amenorrhœa, testicular atrophy, loss of sexual power and desire), and a loss of the secondary sexual characteristics, with the assumption of the feminine contour of body by males. A chromophobe struma is the characteristic lesion in this group representing the hypofunctioning gland.

II. Case Reports and Interpretations.

CASE I.—Cyst of the hypophysis causing the clinical symptoms of hypopituitarism, with primary optic atrophy and atypical visual field distortion. Operation, followed by marked improvement, and no recurrence in two years.

I am indebted to Dr. Cassius D. Wescott for the privilege of studying this case during the past two years and of reporting it now.

S. W., American, male, was seen first, at the age of 15 years, on October 8, 1908, complaining of dimness of vision. He was an undersized, anemic-looking boy, the son of healthy parents who have one other child, a boy two years older than the patient. The mother has had no miscarriages. There is no family history of importance. He had measles, chicken-pox, and pertussis in early childhood, and typhoid fever at the age of 9 years. Since the typhoid infection he has never been robust. His play has been hampered by shortness of breath. Enuresis was present until the sixteenth year. Between the ages of 8 and 12 he was under the care of a physician on account of polyuria. No definite lesion was discovered. The normal changes of puberty did not occur, the voice remaining of the feminine type, erections and sexual desire being entirely absent. Headaches, with nausea and vomiting, occurred at frequent intervals so that he was often compelled to be absent from school for one or two days each week. The pain was frontal and temporal, radiating to the occiput. Photophobia and poor vision were helped in 1904 by securing glasses which he wore for 9 months.

At the time of examination (October, 1908) he stated that his vision had become dim in the right eye six days previously, and after two days had suddenly failed entirely. R. V. = hand movements; L. V. = $\frac{6}{12}$. The right pupil exhibited no direct light reflex. The maculæ were both very granular, and the retinæ of the "shot-silk" type. No lesion was found to account for the poor vision which was regarded as an hysterical manifestation. This opinion was strengthened by the improvement in the right vision to $\frac{6}{16}$ in twelve days, and to $\frac{6}{9+}$ in one week more, with practically no treatment except strong suggestion of recovery. Refraction under atropine cycloplegia on October 28th revealed the following.

R. E. + 1.75 sph. ⊃ + 0.25 cyl. ax. 75° = $\frac{6}{9+2}$

L. E. + 1.50 sph. ⊃ + 0.50 cyl. ax. 80° = $\frac{6}{9-2}$

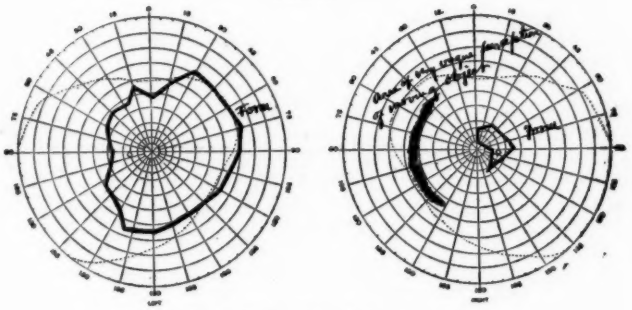
He was given this correction less + 0.50 sph.

Nothing further was heard from the boy until February 3, 1911, when he reported with the complaint of severe sick headache which he attributed to a fall four weeks previously. He had slipped on an icy pavement and struck the back of his head. He was stunned but did not lose consciousness, and succeeded in walking to his home, a distance of several city blocks, without help. He was very positive that some steady failure of vision had been going on for a time previous to the accident, but the failure proceeded more rapidly thereafter until one week before report-

ing, when a sudden decrease in vision occurred, more manifest in the right eye which began to turn outwards.

Upon examination, we found the left eye to fix while the right diverged moderately. Ocular movements were full in all directions, though, with both eyes open, attempted convergence was practically nil with the right eye. The conjunctivæ were unduly pale, the corneæ clear, the pupils 3.5*mm* and round (the right possibly very slightly larger than the left). There was very pronounced hippus, especially on the right; and occasionally, when bright light

FIG. 1.



CASE I—Eighteen days before operation.

was thrown into the right eye, the pupil would first dilate widely and then exhibit hippus. Both pupils reacted promptly to bright light and to convergence; moderate light caused no contraction of either pupil if the other was shaded, but caused contraction of both pupils when both were simultaneously illuminated.

Intraocular examination showed the media to be clear, both nerve heads gray, the right being decidedly more atrophic than the left, with a small pigment heap at the upper temporal border. The disk edges were well defined and there was no evidence of previous neuritis. The arteries were slightly contracted and tortuous, but the vessels and the central area of the retinæ appeared more nearly normal than one would suppose with such atrophic disks. The peripheral parts of both retinæ were thinned, the chorioidal circulation showing very plainly. R. V. $\frac{6}{15}$; L. V. $\frac{6}{15}$; not improved by correction. The fields of vision, as seen in Fig. 1, show, in the left eye, a marked contraction in the temporal half, and, in the right, only a small paracentral area (temporal) preserved, with a crescent-shaped area of very vague perception of the moving object in the nasal field.

The patient was referred for neurological study to Dr. Hugh T. Patrick who made a diagnosis of pituitary neoplasm, and finally to Dr. Allen B. Kanavel for operation. The notes kindly furnished me by Drs. Patrick and Kanavel complete the case history: the patient, though 18 years of age, has the physical development of a boy of 12, with marked pallor. He is somewhat listless and indifferent to his surroundings. His height is 4 feet 9 inches (the same 1 year before). Generalized adiposity is of the feminine distribution, though not excessive; nor are the breasts over-developed. Axillary and pubic hairs are practically absent, there being only a fine down which is not visible to ordinary inspection. Ears, nose, and teeth are normal. (The patient is quite positive that five or six teeth of the second dentition were lost at the age of 12 and a third set developed.) The right half of the mouth is not quite so wide as the left half. Thyroid and thymus are not palpable. There are no glandular enlargements. Lungs, heart, and abdomen are negative, with the possible exception of a slight accentuation of the second heart sounds. Neither superficial nor deep reflexes are impaired.

On February 20, 1911, the boy was admitted to Wesley Hospital. At this time his condition was distressing. Severe headache and almost constant vomiting were uncontrollable. He was exhausted from lack of sleep. The vision could not be tested accurately, but he was practically blind. Polyuria was marked and glycosuria had developed.

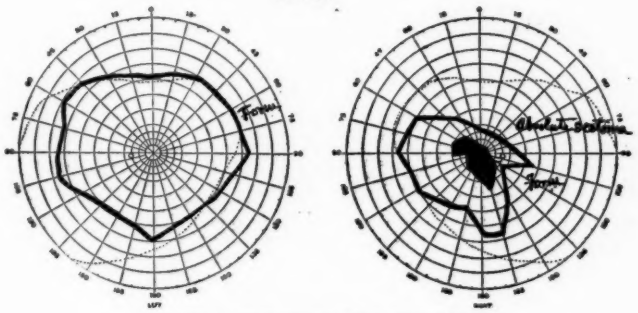
The X-ray picture shows a much enlarged sella with a defective shadow below, which probably indicates an erosion of its floor. The picture does not give any accurate idea about the sphenoidal cells.

Dr. Kanavel operated,[1] on February 22d, by his method of infranasal approach through the sphenoid. Urotropin was administered before admission and continued throughout the patient's stay in the hospital. Local anesthesia (cocaine and adrenalin), with gas and ether by mouth, was followed by rectal anesthesia (ether) during the operation. No sphenoidal cells were found and the bone was chiseled through, exposing a pearly white mass about $\frac{3}{4}$ inch in diameter. Attempt to aspirate the tumor, which was believed to be a cyst, failed. Incision through the dura released fluid, and there was marked pulsation of the mass

[1] This description is taken from the hospital records of Dr. Kanavel, who has reported the case more fully from the surgical standpoint. (Western Surgical Assoc., Cincinnati, Dec. 20, 21, 1912.)

after partial evacuation. Fully one ounce of chocolate-colored fluid escaped. The cyst[1] was curetted, the substance proving to be granular detritus. Efforts to remove the cyst walls were unavailing. The cavity and the nose were packed with iodoform gauze. The nose was sutured into place and the septum held in the median line by the packing. This was removed in three stages at intervals of 36, 48, and 56 hours. Headache and vomiting were almost continuous for 48 hours, when they ceased upon the removal of the gauze, which was followed by a gush of at least ½ ounce of fluid. Glycosuria ceased immediately

FIG. 2.



CASE I—Five weeks after operation.

after the operation; after ten days polyuria returned (6400 *cc*); acetonuria was discovered and treated successfully by levulose medication, while the polyuria rapidly subsided. An infection of the face developed, suggestive of erysipelas, which was gone in one week's time. There was immediate improvement in vision and the headache ceased after three days, and has not returned. The patient was able to leave the hospital on March 17, 1911, and was exhibited before the Chicago Neurological Society. His vision was R., hand movements; L., $\frac{6}{15+1'}$. No change was observed in the eye grounds.

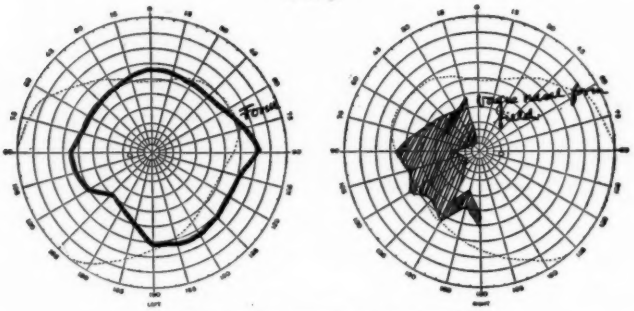
On March 30th, we noted: R. V. with correction, $\frac{1}{45}$; L. V. with correction, $\frac{9}{9}$. The fields of vision show distinct improvement (Fig. 2). In the left, the temporal

[1] Dr. S. A. Matthews of the University of Chicago, in a personal communication, tells me that he found the cyst contents to contain a pressor substance. He injected it into a dog weighing 3*kg* and obtained an increase of 20*mm* of mercury which persisted for more than one half hour. Dr. Matthews calls attention to the fact that cystic fluids generally cause a fall in blood pressure

field has widened approximately from 30° to 60°. In the right, the boundaries include most of the space between the two small areas preserved on February 3d, being roughly 30° both up and temporally, and 50° both down and nasally. There is a large central scotoma.

On February 10, 1912, he was comfortable and the left vision still $\frac{6}{9}$. On March 7th, he complained of blurring in the left nasal field. The left disk was found to be very pale, almost the color of the right disk. Rhinoscopic examination revealed no mass projecting from the sphenoid, only an exuberant mucous membrane, and Dr. Kanavel could find no evidence of a refilling of the cyst. The field of vision of the left eye showed some temporal contraction as compared with the fields taken on March 30, 1911, but a

FIG. 3.



CASE I—Twenty months after operation.

wider field than that of February 3, 1911 (before operation). He was given strychnia gr. $\frac{1}{40}$ t. i. d. On April 2, 1912, L. V., $\frac{6}{9+2}$. Strychnia was increased to gr. $\frac{1}{30}$ t. i. d.

On October 15, 1912, the patient called at our request. The left vision is $\frac{6}{9+2}$. He is feeling well and working with comfort. The fields (Fig.3) show, in the left, a widening on the temporal side exceeding the field taken in March, 1912, and almost equal to the field of March, 1911 (which is the best recorded); in the right eye there is a decided failure since March, 1911, the form field being only vague and limited to the nasal side, not reaching fixation and being wanting in part of the upper and lower nasal quadrants. The right vision is fingers at 8 inches instead of $\frac{1}{15}$ as noted in March, 1911.

Under Dr. Kanavel's direction, the patient received from 9 to 12 grains daily of anterior lobe extract for the period of six months following the operation. No growth was observed during this time, but possibly some develop-

ment of hairs on the arms. For the next two months he received from 9 to 12 grains daily of extract of the whole gland. Following this his sugar tolerance was tested. While taking 24 grains of whole gland extract he was given 150 grams of glucose without the production of glycosuria. The patient refused to remain in the hospital longer than five days for these tests. Since that time (14 months) he has received 24 grains of whole gland extract daily with no change in measurements.

Interpretation: This case is a fairly typical example of the Fröhlich syndrome which Bartels called "dystrophia adiposogenitalis": an underdeveloped, overfat boy with infantile sexual organs, entire absence of secondary sexual characteristics, and a history of polyuria, with eye symptoms suggestive of chiasmal disease (primary optic atrophy and visual field contraction chiefly on the temporal side). The early transient failure of sight is consistent with the cystic character of the growth found at operation. The trauma followed by rapid decrease in vision, severe headache, nausea and vomiting, polyuria, and glycosuria just before operation, are indicative of intracranial growth. The mass evacuated gave proof of a degenerative change in the hypophysis, including the pars anterior, and the pars intermedia (detritus; blood pressure rise on injecting the fluid into a dog). Polyuria, so frequent in cases of hypopituitarism, is difficult to explain in the light of experimental knowledge. Mechanical stimulation of the posterior lobe by the growth in front would account for stimulation of the renal epithelium; but the adiposity is believed to be the result of insufficient posterior lobe secretion. The glycosuria developing just before operation (when the patient was taking no food) was a transient phenomenon and cannot be explained as an evidence of posterior lobe stimulation, but as the result of the tremendous intracranial pressure, as is found in many cases of brain tumor. The widening of the visual field after operation was mainly observed in the temporal half, being a reversal of the original process of narrowing characteristic of these cases.

In view of the general condition, since associated with deficient hypophysial function, which this patient exhibited in boyhood we must believe that his visual disturbance in 1908 was of pituitary origin and not hysterical. Trauma was

in all probability a factor in the rapid increase of symptoms in 1911. Cushing[1] found a history of injury in six of his cases, all being of the class of hypopituitarism. He states that 15 per cent. of a series of 300 cases of brain tumor gave a history of trauma. Postoperative polyuria was extreme, a condition often observed as a transient phenomenon. Whether the trauma of the surgical manipulations caused it is an interesting question. In connection with the post-operative improvement in the vision of the left eye, Cushing's[1] observation is of interest: "Amblyopia associated with primary atrophy more often represents a physiological block to light impulse than an actual destruction of the nerves."

CASE II. Dyspituitarism (Cushing); a case presenting evidence of former hyperfunctioning of the hypophysis, succeeded by a state of glandular insufficiency, probably due to pressure from a neighboring growth. Abducens paresis (right); primary optic atrophy, both eyes, with blindness (right) and temporal hemianopsia (left).

B. T., male, aged 16 years, of Norwegian birth and parentage, was seen first on October 17, 1912, through the courtesy of Dr. E. V. L. Brown. His complaint was blindness in one eye and headache.

The family history reveals nothing of importance. The father died at the age of 43 from heart disease. The mother is 44 years old and healthy. One brother died from injury at the age of 17 years. Several children were born dead (premature?).

The patient is the second child; birth was normal; he had measles and scarlet fever in childhood. At the age of two years he fell down two flights of steps and struck on the right side of the forehead, making a scar which is still visible. Since earliest school days he has suffered from severe headaches which finally necessitated his giving up his schooling. Five years ago, after coming to America, he consulted an optician on account of headache, and was told that his right eye was almost blind and his left below normal in vision. The headaches were severe enough to incapacitate him for a day or more. No nausea or visual disturbance accompanied them. Glasses benefited him in respect to headache but did not improve vision. Several changes of lenses were made in the next two years. Two years ago he observed a dimness in the left visual field, and a decrease of vision in each eye, the right becoming

[1] *The Pituitary Body and its Disorders*, 1912.

practically blind. He worked as a grocery clerk for eighteen months, but had to abandon this some four months ago. The headaches, which were formerly frontal, assumed a bitemporal character, and the pain would be increased by tipping the head to either side.

In November, 1911, while visiting in Christiania, he consulted Prof. Schiötz, who told him that the visual disturbance was due to brain pressure, and gave him medicine. On August 31, 1912, he saw Dr. E. V. L. Brown, who noted L. V., $\frac{5}{10+3}$, and again on September 20th, L. V., $\frac{5}{10-2}$. Refraction: L. $\pm$0.75 sph. $+$ 1.00 cyl. ax. 180° = $\frac{5}{10-2}$ Prof. Schiötz writes as follows in reply to Dr. Brown's request for information as to the findings in 1911: "Dec. 9, 1911. The sella turcica seems to be dilated and the dorsum thinned and deviated backwards. When he consulted me his right eye was completely blind; on the left S = $\frac{6}{10}$. Loss of entire temporal field. I did not advise operation, only remarked that if sight continually decreased, operation perhaps ought to be tried (trepanation)." On September 25th, Dr. Brown noted L. V., $\frac{6}{10+2}$ (after three minutes' effort); with correction, the same.

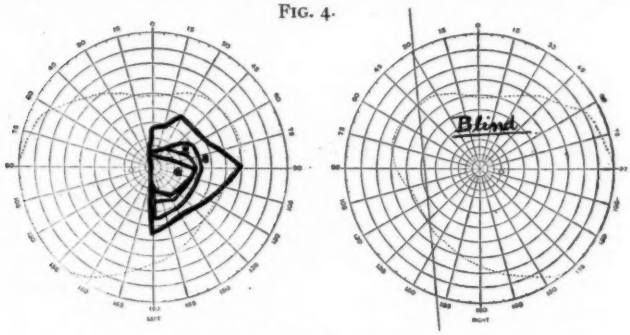
My examination on October 7th duplicated Dr. Brown's findings of the previous month. There was no exophthalmos. The right eye was convergent 10° and tilted up a trifle, while the left fixed. Excursions were full except for failure of the right eye quite to reach the external canthus in rotation to the right. Slight nystagmoid movements developed at the extremes of all rotations, and a slow up-and-down movement of the right eye was exhibited whenever the left eye fixed intently. The lids were normal in appearance; the palpebral fissures of equal width; the palpebral conjunctivæ were very red, the bulbar conjunctivæ slightly injected. The corneæ were clear; the irides bright (hazel). The right pupil was 3.5*mm*, the left 3*mm*, both round. The right contracted very slightly when exposed to light, but promptly when light was thrown into the left eye. Prompt light reaction of the left pupil; and prompt bilateral reaction to convergence. Wernicke's hemianopic pupillary reflex was not present. Tension was normal in both eyes.

Intraocular examination revealed: Right eye, media clear. The disk pearly gray. Physiological cup; edges not sharply defined, but no exudate. Veins noticeably dilated, with wide central light streak. Pulsation of the large veins on the disk. Arteries decidedly contracted, with pronounced central light streak. Arteries slightly depress veins at crossings. Macula granular, but no lesion. No retinal or choroidal atrophy, except for one roughly quadrilateral area about ½ D. D. in extent, situated 2 D. D.

down and nasally from the disk. This is of a peculiar slate color, traversed by a branch of the lower temporal vein and a branch of the lower nasal artery, which cross within this dark area. Several minute vessels can be seen, all of the vessels being on a level anterior to the dark patch, which is perfectly flat. The perivascular lymph sheaths, which can be seen at various places, are especially prominent in this particular area.

Left eye: Media clear. The disk is pearly gray, especially at the temporal half, with a very deep physiological cup. The nasal portion is over-capillary. The edges are not sharply defined, but there is no swelling. The veins are larger than normal, though not so large as in the right

FIG. 4.



CASE II—October 15, 1912.

eye. The arteries are possibly a little contracted, but not so small as in the right eye. The central light streaks are fairly pronounced, and both sets of vessels are inclined to be tortuous. There is evident depression of the veins where they are crossed by the arteries. Somewhat uneven calibre of the larger venous trunks, and pulsation. There is a large cilio-retinal artery running outwards and slightly downwards from the temporal edge of the disk. The macula is granular, but shows no lesion. There is no choroidal or retinal atrophy, except in the upper nasal quadrant, where there is an irregular area reaching 2 D. D. in which there is a slight degree of the slate-colored appearance noted in the right eye. The retina is evidently thin in this locality, and the discolored area is flat, being traversed by blood-vessels which occupy an anterior position.

The visual field of the left eye (Fig. 4) shows an almost typical temporal hemianopsia, the macula and a very small portion of the temporal field above fixation being preserved.

Fields taken the following week reveal difference in respect to the outline of the form field and the interlacing of colors, which is characteristic of the changeable fields in hypophysis cases.

Dr. Ralph Hamill made a neurological study of the patient, and very kindly allows me to use his notes from which the following is partly quoted: the boy is sturdy-looking, of medium height, well developed for his age (16 years). The features are heavy, hands and feet large; skin coarse and perspires rather freely. The face is covered with acne. The nose is very broad and the right half a trifle larger than the left. Some rather coarse tremors of outstretched hands and fingers, not intentional; some tremor of lips when he shows his teeth, and of the protruded tongue. The facial, auditory, and fifth nerves are not involved. The penis and testicles are large, the pubic and axillary hairs abundant. He has had no emissions, but frequent erections and sexual desire in the past year. Height 5 feet $5\frac{7}{8}$ inches; feet $9\frac{6}{8}$ inches long; weight 144 pounds. He thinks he has fattened ten pounds and grown one or two inches and become physically stronger in the past year.

Prof. Schiötz sent a picture of the X-ray taken at his clinic in November, 1911. Dr. H. E. Potter made a second X-ray, revealing substantially the same condition. The sella is not deepened but is tilted backwards, and there seems to be an erosion of the bone just beneath the posterior clinoid process.[1]

The patient was admitted to the Presbyterian Hospital on Nov. 4, 1912, in the service of Dr. James B. Herrick, where further studies were made by Dr. R. T. Woodyatt to whom I am indebted for access to the hospital records. General examination revealed nothing of importance beyond the developmental peculiarities already cited. The Wassermann test was negative. The temperature record, and the carbohydrate tolerance established by feeding, are very important studies from the standpoint of hypophysis functioning. The temperature chart shows readings four times per day for eleven days. These 44

[1] Cushing states that "profile radiographic measurements exceeding 15*mm* antero-posteriorly and 10*mm* in depth may be looked upon as indicating an enlargement." He quotes Arthur Keith (*Lancet*, 1911) to the effect that skeletal measurements of the sella reveal an average of 10 to 12*mm* antero-posteriorly, 14 to 15*mm* transversely, and 8*mm* in depth.

Otis H. Maclay of Chicago has published (*Laryngoscope*, September, 1911) careful measurements from dried skulls as follows: inter-carotid distance, 14 cases average 9.2*mm*; width (between carotid grooves), 20 cases average 11. 4*mm*; depth of sella, 42 cases average 7.6*mm*.

records are mostly between 97° and 98° F.; only 6 times is the temperature as high as normal. For 22 days subsequently the readings were made twice a day. Of these 44 records, with the same subnormal range, the temperature reached normal only 4 times. The pulse was generally between 60 and 70, and the respirations 18 to 22 per minute.

The hospital record contains the following observations of the sugar tolerance:

1. Nov. 10, 1912.
   100*gm* dextrose at 7 a.m. Urine collected between 7 a.m. and 12 noon. No reducing bodies in urine.
2. Nov. 12.
   150*gm* dextrose (same routine as above)—No reducing bodies.
3. Nov. 13.
   200*gm* dextrose " " " " —No reducing bodies.
4. Nov. 17.
   300*gm* dextrose " " " " —No reducing bodies.
5. Nov. 20.
   50*gm* galactose " " " " —3.6*gm* in urine. (Bangs method.)
6. Nov. 23.
   20*gm* galactose " " " " —No reducing bodies.

Thus we observe a low temperature range and a high sugar tolerance, two conditions which Cushing has found to be such frequent accompaniments of the hypophysis disorders characterized by undersecretion, that he believes them to be of diagnostic value.

Interpretation: This case is not so easily classified, with reference to hypophysial functioning, as was Case I. It must be placed under the vague heading of "dyspituitarism," exhibiting a perversion of glandular secretion neither frankly overactive nor underactive. Temporal hemianopsia of the left eye points conclusively to pressure at the chiasm, and the abducens paresis and blindness of the right eye are consistent with this diagnosis. The X-ray pictures are not definite but are suggestive of pressure upon the body of the sphenoid from above. That the hypophysis has been functioning excessively is indicated by the appearance of overdevelopment for a boy of 16 years: heavy features, large extremities, coarse, perspiring skin, and somewhat precocious sexuality. The stationary vision and general comfort, aside

from headaches, for the past year point to a cessation of growth in the tumor. Low temperature and increased carbohydrate tolerance indicate that the hypersecretion of the hypophysis has now been replaced by a hyposecretion, and acromegalic changes are not to be anticipated. A tumor in the region of the hypophysis, perhaps involving the infundibulum, pressing upon the hypophysis secondarily, seems the likeliest explanation of the symptom-complex here seen. The history of injury is remote and possibly not in reality connected with the symptoms of recent years.

Operation has not been advised in this case, because the growth is believed not to be so accessible as a primary tumor of the pituitary body would be (such as in Case I) and because the symptoms are not progressing and there is no danger of acromegalic changes now that the gland is in a state of deficient secretion. The outcome with or without treatment is uncertain, and no very hopeful prognosis is justified.

III. Review of Literature of Eye Symptoms of Hypophysis Disease.

As one might prophesy from the anatomic relationships of the hypophysis (chiasm above; cavernous sinus, third, fourth, ophthalmic division of the fifth, and sixth nerves, on each side of the sella turcica), a great variety of eye symptoms may be produced by enlargement of this gland. Uhthoff[1] mentions prominence in the region of the eyebrows; thickening and lengthening, with pendulous and edematous lids; hypertrophied lid glands and tear glands; warty growths and pigmentation of the lids; and exophthalmos. These pressure symptoms, frequently absent, suggest the question whether their absence or presence may not aid in distinguishing between the acromegalic cases and those representing a hypofunctioning gland; but the literature reveals no such differentiation. In fact, ocular muscle palsies, which might be expected as a result of bony distortion in acromegalics, are more frequent in the opposite type as Uhthoff's[1] statistics, recorded later, will show. Cushing[2] found a larger proportion of exophthalmos in the cases of hyperpituitarism, but not all of these cases were

[1] *Loc. cit.* [2] *Loc. cit.*

frankly acromegalic, and the preponderance is not great enough to be important. Uhthoff[1] found exophthalmos in 8 per cent. of the acromegalic cases and suggests stasis in the cavernous sinus as the most plausible explanation, and hypertrophy of the orbital fat as an explanation of some cases. He states that the rapid growth of hypophysial tumors without acromegaly favors ocular muscle palsies as well as choked disk. Of his acromegalic cases, 10 per cent. revealed muscle palsies. The third nerve was involved 23 times, the sixth nerve 4 times, ophthalmoplegia occurred 3 times, nystagmus 12 times. In the series of tumors without acromegaly, 25 per cent. revealed muscle palsies. The third nerve was involved 26 times, the sixth nerve 7 times, ophthalmoplegia occurred 4 times; in 2 cases the nerve involved was not specified. Isolated fourth-nerve palsy is not recorded. This nerve passes through the cavernous sinus near its outer border, but is scarcely more protected than the third nerve, yet it seems to escape with the first division of the fifth. The sixth, lying against the carotid artery at the inner wall of the sinus, naturally receives pressure from even moderate enlargement of the hypophysis.

A tabulation may be made from Cushing's[2] series containing 36 cases with fairly complete eye examination, in which the symptoms were predominantly those of hyperpituitarism in 11, and of hypopituitarism in 25.

	Exophthalmos	Photophobia	Ptosis	Diplopia	III nerve palsy
Hyperpituitarism	6 (0^2)	2	1	7	2(0^2) 2 (Rt.)
Hypopituitarism	6 (0^2) 1 (Rt.) 1 (Left)	4	1	4	3 1 (L.)

	IV nerve palsy.	VI nerve palsy.	Unequal pupils
Hyperpituitarism			4 (Rt. larger)
Hypopituitarism	1 (Rt.) 1 (Left)	1 (0^2) 5 (Rt.)	2 (Rt. larger) 3 (Left larger)

	Nystagmus	Concentric constriction of fields	Superior hemianopsia
Hyperpituitarism	5	1	1
Hypopituitarism	5	2	

[1] *Loc. cit.*

[2] *Loc. cit.*

	Upper quadrant defect	Inferior hemianopsia	Bitemporal hemianopsia
Hyperpituitarism			1
Hypopituitarism	1 (Rt.) 1 (o²)	2 (Rt.)	7 Left 2 Right 1

	Homonymous hemianopsia	Nasal hemianopsia	Interlacing colors
Hyperpituitarism	2 (Rt.)		3
Hypopituitarism		1 (Left)	1

	Primary optic atrophy	Choked Disk	
		Primary	Superimposed upon primary atrophy
Hyperpituitarism	3	5	1
Hypopituitarism	14 (o²) 1 (Rt.)		8 (o²) 1 (Rt.)

	Secondary atrophy	Primary or secondary?
Hyperpituitarism	3	
Hypopituitarism	1	2

Visual disturbances are indicated in the following tabulation from Uhthoff[1]:

	207 cases with acromegaly	121 cases without acromegaly	
Amblyopia and amaurosis	15 cases	34 cases	mostly in pre-ophthalmoscopic days.
Temporal hemianopsia	89 "	37 "	
Homonymous hemianopsia	9 "	2 "	
Choked disk	11 "	15 "	
Optic neuritis	11 "	14 "	
Optic atrophy	40 "	27 "	
Retinitis	2 "		
Chronic iritis	1 "		
Cataract	2 "		
Peripheral visual field contraction		3 "	
Central scotoma		3 "	
Anatomically proven compression at the chiasm without visual disturbance		12 "	(often with anosmia)

Bartels[2] records 22 cases with the following histories:

[1] *Loc. cit.*

[2] Bartels, *Zeitsch. für Augenheilk.*, Bd. xvi., 1906.

Bitemporal hemianopsia	23%
Unilateral temporal hemianopsia	23 "
Homonymous hemianopsia	9 "
Concentric contraction	22 "
Irregular contraction	4 "
Sector-shaped contraction	9 "
Central scotoma	13 "

In another series of 44 cases he records:

Bilateral simple optic atrophy	20 cases
Unilateral simple atrophy	1 case
Bilateral choked disk	15 %
Neuritis with subsequent atrophy	15 "
Normal fundus	10 "

Bartels thus gives temporal hemianopsia in 46% of cases while Uhthoff's two tables show only 38%. The important fact would seem to be that temporal hemianopsia is by no means essential to the diagnosis of hypophysis disease, and other eye symptoms are of greater importance. It is inevitable that the majority of cases will not be seen just at the time when a typical hemianopsia exists, and it is still more unlikely that both eyes will be affected in the same degrees. Undoubtedly too much stress has been laid upon this characteristic visual-field limitation, and greater familiarity with the subject will reveal hypophysis disease long before such a picture has been produced. Cushing[1] regards the visual-field limitation which eventually produces the picture of temporal hemianopsia as a fairly definite evolution. He says: "The primary defect usually involves the color boundaries alone in one upper temporal quadrant. This is followed by a more or less complete hemiachromatopsia, possibly with a 'slant' in the upper temporal form field, which gradually spreads downward until most of the temporal field is involved. In all cases the color fields are involved first, the form fields later. The macular area is often spared for a long time, but finally it becomes implicated in turn, first in its temporal half; finally the whole central area enters the blind field, and the nasal field in turn progressively shrinks away from the centre. It is to be emphasized that rarely are the two eyes affected in

[1] *Loc. cit.*

equal degree, and also that, after operation, restorations occur in reverse order."

Homonymous hemianopsia occurs in a fair proportion of cases and is explained by pressure at one side behind the chiasm, as may easily happen when the growth is in the hypophysis neighborhood ("hypophysengegend" of the Germans) and secondarily affects the hypophysis.

The tabulation made from Cushing's series exhibits numerous visual-field limitations, their variety emphasizing the importance of refraining from eliminating hypophysis disease from our thought just because the typical field of chiasmal pressure is lacking. Temporal defects short of hemianopsia must be regarded with suspicion, and color defects especially noted. J. Herbert Fisher,[1] in a report of 9 cases, has suggested that color loss is an index to the progress of the disease; and Cushing has treated at length the question of color interlacing in a variety of brain lesions producing increased pressure. This is a matter of especial import since the suggestion of hysteria when color interlacing is found may be encouraged by the rapid alterations of vision in cases of hypophysial cyst, as illustrated in Case I reported above. Daily variations in the fields are often observed, and their tendency through a period of weeks or months may be significant of the effects of glandular therapy, as maintained by de Kleijn.[2]

Amblyopia and amaurosis, like temporal hemianopsia, are the predominant findings in the early literature, as emphasized by Uhthoff. They represent late appearances which were the only diagnostic signs of pituitary disease known to the older ophthalmologists.

Primary optic atrophy is much more frequent than neuritis and secondary atrophy, owing to the location of the growth which presumably compresses Schwalbe's sheath, preventing the distension which ordinarily causes papilledema when intracranial pressure is excessive.

Ordinary neuritis, or the extreme degree manifested in choked disk, may occur and may be superimposed upon a

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[1] "The Pituitary Body and Lesions of the Optic Chiasm," *Trans. Oph. Soc. United Kingdom*, 1911.

[2] de Kleijn, *Graefe's Arch. für Ophthal.*, lxxx., p. 307.

primary atrophy when excessive intracranial pressure is a late and rapid development.

Scotomata are mentioned with comparative infrequency in the literature. Their appearance has even been taken to exclude the diagnosis of hypophysis disease. Bartels records them in 13 % of 22 cases; but obviously the cases are too few to allow any inference to be drawn. v. Frankl-Hochwart[1] records 1 scotoma in 31 cases. Uhthoff mentions central scotoma only 3 times among 328 cases. Patrick speaking from the neurological standpoint, and de Schweinitz and Holloway[2] speaking from the ophthalmological standpoint, have emphasized the comparative frequency of scotomata and their importance. The latter writers have recently presented the following classification:

1. Small and paracentral scotomata.
2. A quadrant up and out.
3. Scotomata varying in size and position.
4. Bitemporal hemianopic scotomata.
5. Scotomata in the temporal field at some distance from the fixation point.
6. Blurred vision, unexplained by any ophthalmoscopic lesion.

These scotomata may be absolute or relative and may all be the beginning of larger defects which will eventually become hemianopsias.

In view of the multiplicity of eye symptoms which may indicate pituitary disease we are warranted in keeping in mind this possibility and hoping for more early diagnoses than we have heretofore made.

I desire here to express my gratitude to the colleagues whose names have been mentioned, for their generosity in placing their material at my disposal and for aid in the study of the cases.

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[1] v. Frankl-Hochwart, *Wien. med. Woch.*, 1909, Heft 37–39.

[2] Section on Ophthalmology, Amer. Med. Assoc., 1912.

ILLUSTRATING DR. DE SCHWEINITZ'S ARTICLE ON "EPIBULBAR CARCINOMA; HISTOLOGIC EXAMINATION OF THE SPECIMEN."

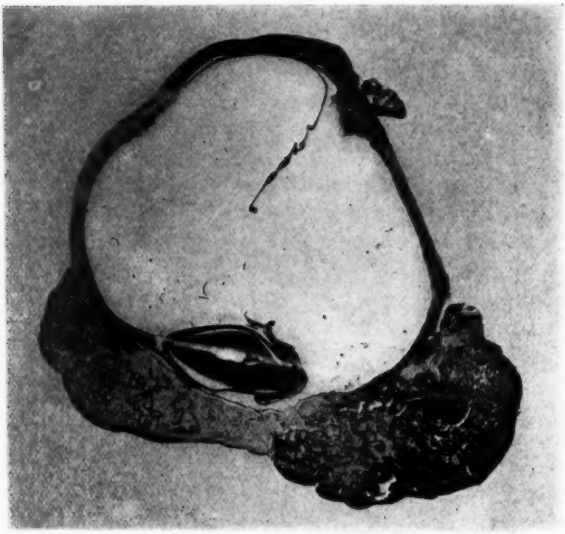

FIG. 1. Section of eyeball showing position of epibulbar growth.

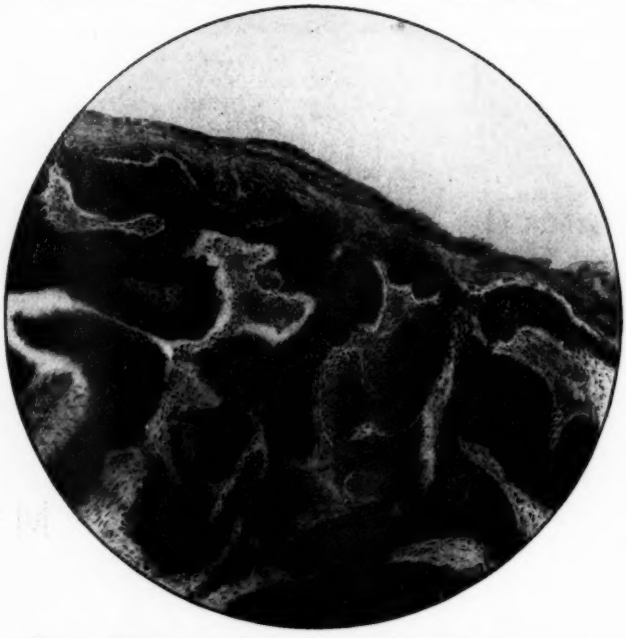

FIG. 2. Primary epibulbar carcinoma; microscopic appearances.

EPIBULBAR CARCINOMA; HISTOLOGIC EXAMINATION OF THE SPECIMEN.[1]

By G. E. de SCHWEINITZ, M.D., and E. A. SHUMWAY, M.D.,
PHILADELPHIA.

(*With two illustrations on Text-Plate VIII.*)

ALTHOUGH the subject of epibulbar carcinoma has occupied the attention of ophthalmic pathologists and clinicians, and elaborate studies of this type of neoplasm are on record, it may not be out of place to describe the history and microscopic examination of the present specimen.

History.—A man, aged thirty-four, came to the University Hospital on November 4, 1912, for the examination and treatment of an epibulbar growth of the left eye. In childhood the patient had measles, chicken-pox, and whooping-cough, and in later years pneumonia, malaria, and typhoid fever. He admits Neisserian infection, and also that at the age of twenty-three years he acquired a lesion, which probably was the initial lesion of syphilis. Born in California, the patient has lived in various parts of this country and for the last three years in Philadelphia. His occupation is that of a packer in a vacuum-cleaning establishment. He is married, has one child living and well; his wife has had four miscarriages. His habits are good; he smokes moderately and occasionally drinks beer, but not to excess. The patient's father died of unknown cause; his mother is living and well; two brothers are alive and in good health. There is no history of tuberculosis or neoplasm in the immediate family or among relatives with whom he is acquainted.

History of the Present Condition.—In 1898 the patient noted a small yellowish-white papular growth the size of a split pea at the inner corneal margin of the left eye. The

[1] Read before the American Ophthalmological Society, Washington, D. C., 1913.

surrounding blood-vessels were injected, but there was neither pain nor disturbance of vision. This growth remained stationary for about three years. Eleven years ago he applied at the dispensary of the Pennsylvania Hospital for treatment, and there the lesion was cauterized with the actual cautery. Following this cauterization he reports rapid enlargement of the growth, so that it soon covered one-third of the pupil space. For a period of four years the neoplasm remained quiet and did not grow in size, when, following what he calls cold in the eye, the growth began to increase in size, and by the year 1907 had covered the whole front of the eye to such an extent that it protruded between the lids and in appearance reminded him of a large strawberry. One year ago this protruding mass underwent a species of softening and liquefaction, and soon developed the appearances which were present at the time of examination.

Physical Examination.—The patient has neither cough nor night sweats, the appetite is good, the bowels are regular and their palpation reveals no abdominal growth of any description. Examination of the urine was practically negative, with the exception of a few oxylate of lime crystals. The blood count was as follows: Red blood corpuscles, 5,220,000; white blood corpuscles, 6,300; hemoglobin, 90. There was no eosinophilia; polymorphonuclear leukocytes, 91; leukocytes, 8. Careful examination of the nasopharynx and accessory sinuses failed to reveal anything except a slight nasal catarrh. The Wassermann test was positive; Von Pirquet's test was negative.

The vision of the right eye was normal, and it showed no abnormalities of any character. The entire front of the left eye, the vision of which was faint light perception, was covered with a thick, grayish-yellow or, more accurately, reddish-yellow mass, very closely resembling granulation tissue, the center of which was somewhat umbilicated and contained some sloughing detritus. The eyeball movements were normal and palpation failed to reveal any growth in the deeper portion of the orbit.

The eyeball was enucleated on November 12, 1912, and exploration of the orbit after enucleation failed to reveal the presence of any suspicious tissue. In due course an artificial eye was adjusted, but at the expiration of three months the patient returned with the tissues of the orbit much swollen, and in the upper and inner portion of the cavity an indurated mass was visible, evidently representing a recurrence of the growth. Thereafter a complete exenteration of the orbit was performed, healing was entirely kind, and up to the present time, eight months after the operation, there has been no sign of recurrence.

Macroscopic Examination.—The anterior segment of the eyeball is covered by a tumor mass, which measures *27mm* across, and extends backward along the outer surface of the sclera a distance of *6mm* on the temporal and *4mm* on the nasal side. The growth appears to consist of two lateral masses, one on either side of the former site of the cornea; the portion on the nasal side has a thickness above the sclera of *8mm*, that on the temporal side of *5mm*. Between them is a depression where the cornea has been replaced by a faintly staining tissue, which measures *2mm* in thickness. The lens is displaced forward and to the temporal side, pulling the ciliary body away from its scleral attachment. The retina is totally detached (Figure 1).

Microscopic Examination.—The tumor surface is covered by a layer of flattened epithelial cells, which have undergone horny change, their nuclei no longer staining with the hematoxylin. The tumor substance is composed of broad processes of cells in direct connection with, and extending backward from, the surface epithelial cells, the stroma being a dense connective tissue, which has developed from the sclera and episcleral tissues.

The cell masses extend in various directions, some of the processes being cut longitudinally, some transversely, and some obliquely. The outermost cells of the columns stain deeply, and are columnar in shape; toward the center, well-marked changes in the cells are in evidence, due to nuclear degeneration. The cells become larger and vacuolated, the nuclei stain faintly, and the chromatin is much reduced in amount. In places the central cells are flattened, and tend to form typical pearls, but there is no definite keratinization. Careful focussing shows also occasional prickle cells, and while the cell form varies a great deal, becoming spindle-shaped in certain positions where the growth has been rapid, there is no intracellular substance, and the tumor is unquestionably a squamous-celled type of carcinoma, developing from the conjunctiva (Figure 2).

The cornea, except for a few of the posterior lamellæ, has been replaced by a dense connective mass, composed of bundles of fibrous tissue running in various directions, in which there are comparatively few blood-vessels. The columns of epithelial cells extend into this tissue from the temporal side, and have invaded it to a point a short distance in front of Descemet's membrane. The columns of cells here are narrower than in lateral portions of the tumor. On the side next to the nasal mass there is an area which is free from carcinoma cells, but which is densely infiltrated with leukocytes, chiefly of the polymorphonuclear type. In this portion the surface epithelium is absent, the tissues

are necrotic, contain very few staining elements, aside from the leukocytes, which are also undergoing degeneration, and the condition is evidently due to surface ulceration, with infection of the underlying tissue. The posterior corneal lamellæ are irregular, but Descemet's membrane is intact, and shows no sign of perforation. The sclera has resisted the penetrating cells, and the main mass of the tumor has progressed backward along its outer surface as far as the insertion of the recti muscles. On the nasal side there is beginning involvement of the perivascular spaces of the perforating ciliary vessels, but the interior of the eyeball is free from invasion. The base of the growth, especially at the position where it is advancing backward along the sclera, is deeply infiltrated with round cells, chiefly of the mononuclear type, which represent the usual reaction of the organ to the presence of the malignant growth. The episcleral vessels are widely dilated and there are numerous hemorrhages, some of them being of considerable standing, showing masses of blood pigment.

The crystalline lens is pushed forward, especially on the temporal side, where the anterior chamber is abolished, and the iris here is in contact with the posterior surface of the cornea. The lens shows no pathologic changes. On the nasal side, the ciliary body has been torn away from the sclera by the displacement of the lens, the iris and ciliary body on this side being adherent to the lens capsule in front of and behind the equator. The retina is detached and passes forward to the posterior pole of the lens.

The iris shows a chronic iritis, indicated by its infiltration with mononuclear round cells, especially along the vessels; the stroma and the sphincter muscle are atrophic. The ciliary muscles are also atrophic; the vessels of the ciliary processes and choroid are hyperemic. The retina is entirely atrophic, being converted into a dense connective-tissue cord, from which all nervous elements have disappeared, and is irregularly infiltrated with pigment from the retinal pigment cells, particularly along the thickened blood-vessel walls. The optic nerve is atrophic, the nerve-bundles being reduced in diameter, and the septa considerably increased in thickness.

The recurrence in the orbit consists of a nodule 9*mm* in diameter, composed of orbital tissue, which has been partly destroyed by columns of epithelial cells, running in various directions. The cells resemble those of the deeper cells of the surface epithelium of the conjunctiva. There are many mitotic figures, a moderate amount of karyorrhexis of the nuclei of the cells, in the center of the infiltrating process, and round-celled infiltration of the

orbital tissue in advance of the growth. Epithelial pearls are absent, but prickle cells can be made out.

The pathologic examination has, therefore, confirmed the clinical diagnosis of *primary carcinoma of the conjunctiva*, beginning at the limbus. It may possibly have started as a papilloma, and, as the result of cauterization, may have been stimulated to rapid growth and then assumed a malignant type.

Primary carcinoma of the bulbar conjunctiva cannot be said to be of common occurrence, although a good many cases are now on record. In 1908, Rschanitzin searched the literature in Michel's *Jahresbericht*, and found 502 cases of conjunctival tumors. His classification includes 250 benign and 252 malignant growths. Of the malignant forms, 149 were carcinomas and 103 were sarcomas. Primary carcinoma of the bulbar conjunctiva is less frequent than carcinoma of the eyelid, secondarily involving the eyeball. The literature of the subject up to the year 1904 may be found in Saemisch's article on "Diseases of the Conjunctiva," in the second edition of the *Graefe-Saemisch Handbuch der Gesamten Augenheilkunde*,[1] and from 1904 to 1910 in an article by Heilbrun, in *Graefe's Archiv f. Ophthalmologie*.[2] An examination of the *Jahresbericht* and the *Index Medicus* has revealed a few more reports, reference to which will be found at the end of this paper.

Of practical importance in connection with these growths from a clinical standpoint is invasion of the eyeball. Some authors, for example, Axenfeld, Greeff, Wintersteiner, and Saemisch, consider that they rarely penetrate the globe, while Ginsburg and Parsons express an opposite opinion. Ischreyt in 1906 reviewed the subject carefully, and tabulated 47 cases from the literature. He assumed that there was perforation where the invading cells had reached the inner surface of the sclera or the region of Schlemm's canal, even where the anterior chamber was not involved. In 17 of the 47 cases perforation had actually occurred, a percentage of 36.1. In the literature since 1906 we have been able to find the reports of six additional cases of epibulbar carcinoma, and in three of

[1] Volume v., p. 677.

[2] Bd. lxxvii., 1910, p. 541.

them perforation of the globe was demonstrated. In 53 eyeballs, therefore, perforation occurred in 20, or 37.6 per cent. Hence, although the cornea and sclera offer a considerable resistance to the growth of the tumor, especially if Bowman's membrane be intact, it is evident that perforation occurs in a considerable number of cases, especially if the neoplasm has been present for a long period of time.

Frequency of perforation depends largely upon the site of the tumor. It has been found that those growths which are situated at the corneal limbus are much more apt to penetrate the globe than those placed at a distance from it, and, as is well known, the region of the penetrating ciliary vessels presents a feeble resistance to a growing carcinoma, because its cells invade the tissue along the perivascular lymph-sheaths. This fact is of great importance in determining the proper surgical procedure in any given case. Should the carcinoma be situated at the limbus, and should it be of very small size, deep excision may be practised, but only if the patient can be kept under prolonged observation. Growths at a distance from the limbus may be excised, with less danger of recurrence. It is true, however, that in the majority of cases the tumor is situated at the limbus. The epithelium changes in character in passing from the conjunctiva to the cornea, and, moreover, has a tendency here to send in irregular processes, as was shown particularly by Nakajawa. In this position, too, the growths are liable to injuries, often of a trifling character, but many times repeated. According to Lagrange, implication of the lymphatic glands in the neighborhood is rare, but occasionally occurs. Parsons says that the preauricular glands are first affected, and the submaxillary glands later. The existence of such a glandular involvement would be an absolute indication for enucleation, which, indeed, must be performed in the great majority of cases.

Another point of interest in connection with our case is the age of the patient. As a rule, this form of carcinoma is most frequently found in individuals over forty years of age. In 7 patients with epibulbar carcinoma, collected by Rogman, the ages respectively were twenty months, twelve years, thirteen years, nineteen years, twenty-seven years, thirty-

five to forty years, and thirty-seven years. The case-histories of other patients have since been reported by Hartmann (twenty-nine years), Bianchi (twenty-eight years), and Heilbrun (twenty years). As the growth first appeared in the present instance fifteen years before the operation, it must have originated when the patient was nineteen years of age.

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TOXIC AMBLYOPIA DUE TO TOBACCO ALONE.[1]

By MATTHIAS LANCKTON FOSTER, M.D., New Rochelle, N. Y.

IN presenting this case to you I wish to call attention to the etiology, and to the unusually good result obtained by prolonged treatment.

A. B., 65 years of age, consulted me on August 2, 1911, because of a blurring of vision that had persisted for eight or ten months. He had been an inveterate smoker for many years, was seldom without a pipe in his mouth for any great length of time. He stated that he had occasionally drank a glass of beer when a young man, but that he had drank no intoxicating liquors of any kind for over forty years, and that he did not indulge in patent medicines. He gave no history and presented no symptoms of syphilis, multiple sclerosis, or of any other organic disease of the central nervous system, aside from the trouble in his optic nerves and the fact that he frequently felt dizzy after smoking. He had worn +1.75 D. sph. for distance quite a number of years; with this glass the vision of his right eye was $\frac{20}{70}$, that of his left $\frac{20}{200}$; without it the central vision of each eye was reduced to counting fingers at four feet. A central scotoma for red was present. The temporal side of the head of each of the optic nerves was so very white that I did not hesitate to record it in my notes as atrophy of the papillomacular bundle of nerve fibres.

The most essential part of the treatment was the immediate and total abstention from tobacco in any form. In addition to this, strychnine nitrate was injected subcutaneously, beginning with a small dose, which was increased daily until physiological symptoms were obtained. The amount required to induce these symptoms in this patient was $\frac{1}{5}$ of a grain. From that time on $\frac{1}{6}$ of a grain was

[1]Read before the American Ophthalmological Society, Washington, D. C., May 7, 1913.

injected subcutaneously twice a week for eleven months, the patient taking at the same time $\frac{1}{16}$ of a grain of strychnine sulphate by mouth three times a day.

The vision of his worse eye, the left, improved within two weeks to $\frac{20}{60}$ with the glass he was wearing. After that the improvement was slow but constant. At the end of six months the vision of his left eye was $\frac{20}{30}$ with +1 D. sph. +1 D. cyl. axis 180°; that of his right eye was even better; at the end of one year it was $\frac{20}{20}$ in each eye with the correction; R. +1 D. sph. +.75 D. cyl. axis 180°; L. +1 D. sph. +1 D. cyl. axis 180°. At this time the appearance of the fundus was normal, and no affection of the papillomacular bundle could be seen. On March 3, 1913, eight months after the discontinuance of treatment, the vision of the right eye was $\frac{20}{15}-$, that of the left $\frac{20}{15}-$, with the correction given above, but objects seemed a little "fuzzy" when seen with the left eye in comparison with their appearance to the right. No central color scotoma could be detected in the right eye, but a minute central scotoma for red was present in the left.

Adam says in his *Ophthalmologische Diagnostik*, published in 1912, that it is doubtful if tobacco *alone* is competent to induce disease of the papillomacular bundle of optic-nerve fibres. "Ob Nicotin *allein* eine derartige Einwirkung haben kann, ist zweifelhaft." This statement voices a feeling that is, I think, rather widespread, and is by no means inexplicable. Most men drink alcoholic beverages more or less, relatively few are total abstainers, and it is probable that the proportion of the latter is still smaller among men who use tobacco. It is generally admitted that the habitual use, or rather abuse, of alcohol and tobacco together is able to excite a disease of the papillomacular bundle of fibers in the optic nerve, that the proportionate quantities of the two necessary to induce this disease varies a great deal in individuals, and that total abstention from both is needed for a cure. We also know that habitual drinkers are not always perfectly truthful, so that when we see a patient with toxic amblyopia who admits that he uses tobacco to excess, but denies that he drinks, we question at once whether he is telling the truth about the latter. In the majority of cases we are unable to answer this question. On one occasion I sent a patient whose word I doubted to a physician to have his stomach examined, and

received a report which seemed to indicate clearly an alcoholic gastritis, but we cannot always have recourse to such an expedient. If we wish to investigate we have usually the difficult task of proving a negative. Absolute, incontrovertible proof that a man does not drink any form of alcoholic beverage can hardly be obtained, for this would require incontestable evidence covering every moment of the day and night for a long period of time, but I think it will be accepted as the best possible negative evidence if it can be shown that a man has lived many years in the same community, has been well known, and has maintained the reputation of a total abstainer during that time. I think that everyone will agree that it would not be possible for a man to live forty years in a small community, maintain the reputation of a total abstainer, and yet drink alcoholic liquor in sufficient quantity and with sufficient regularity to excite a toxic amblyopia. In order therefore to ascertain the facts in regard to this patient I inquired of a number of people who had been acquainted with him for years, including his family physician, and learned that he was well known in the community, had lived there nearly his entire life, and that none of them had ever known him to drink, or had ever heard of his having done so. His reputation as a total abstainer seems to be absolutely spotless. This is therefore a case in which a well marked disease of the papillomacular bundles of optic-nerve fibers developed in a man who had smoked excessively for many years, during which he had not been known to drink any form of alcoholic beverage. Inasmuch as this disease recovered after total abstention from tobacco, as no signs of multiple sclerosis, or of any other disease of the central nervous system could be detected in the course of a year, and as he has continued to enjoy good health and good vision since the cessation of treatment, the evidence seems to be sufficient to prove that tobacco alone was the exciting agent. A single case of this kind is enough, I think, to prove that tobacco *alone* is competent to cause the lesions characteristic of toxic amblyopia.

OPHTHALMIA IN THE FORM OF CONJUNCTIVAL PATCHES.

By Prof. FRANZ FALCHI, Director of the Eye Clinic in the Royal University of Pavia.

Translated by Dr. Alfred Braun, New York, from *Archiv für Augenheilkunde*, Vol. LXX., Part 2, 1911.

(*With illustrations on Plates XX. and XXI. of the German Edition.*)

THERE have been observed on the conjunctiva, outside of the clinical manifestations which are caused there by acute infectious processes, the characteristic appearances of xerosis, spring catarrh, tuberculosis, syphilis, molluscum-contagiosum, small-pox, pemphigus, conjunctivitis-petrificans, and ophthalmia-nodosa. There are also known, various degenerative processes of this mucous membrane, as well as congenital and acquired anomalies of its development. All of these diseases of the conjunctiva have distinct clinical appearances, and their minute structure has been studied, from a histo-pathologic and histo-chemical point of view, as well as from the bacteriological and embryological side.

I had the opportunity to observe a special form of conjunctival disease, which I have called "ophthalmia in the form of conjunctival patches," because it has distinct clinical manifestations, which differ from those conjunctival diseases mentioned above.

I was able to follow up this ophthalmia during its entire clinical course, and to study its histo-pathology by means of experimental examinations. Based upon these examinations, I offer a method of treatment for this disease.

I.

CLINICAL HISTORY.

L. C., from Dorno Lomellina, single, 22 years of age, is normally built. Menstruation was always normal. Parents and three brothers are alive, and have never had any eye trouble.

The patient had typhoid at the age of 8 years, with a relapse at the age of 10. She had repeated attacks of malaria and influenza. At the age of 17, she had a pleurisy.

She worked in rice-fields, and, later on, as a domestic. On November 16, 1903, she developed a conjunctivitis of the right eye, while working in the field, which she ascribed to the entrance of dust into the conjunctival sac. This was accompanied by a sensation of burning, lachrymation, photophobia, pain in the eyeball, neuralgia in the distribution of the first and second branches of the fifth nerve, and fever.

The attending physician cured the conjunctivitis with a bichloride solution 1:5000, but there remained white patches on the conjunctiva, and a feeling of discomfort in the eye. I saw the patient for the first time, in the eye clinic at Pavia, on January 11, 1904.

The eyelids are normal. On the conjunctiva of the fornix, of the tarsus of the lower lid, and on the lower half of the bulbar conjunctiva, there are seen white patches of various sizes. During the various periods, when the patient stayed in the clinic, I was able to follow, very carefully, the cycle of evolution of these recurring patches.

Prodroma.—The conjunctival disease was ushered in by a neuralgia of the first and second branches of the fifth nerve, accompanied by fever, for three or four days, not exceeding 37.8° C., in the axilla. There was a burning sensation in the eye, with marked photophobia, and an otitis of the opposite side. Very often, menstruation set in at the same time.

Symptoms.—On the conjunctiva of the right eye, which was the first to be affected, there was observed, in the first twenty-four hours of the affection, congestion of the tarsal conjunctiva and the bulbar conjunctiva. There were photophobia, lachrymation, and slight secretion.

With a strong convex lens, there could be seen at this time, on the conjunctiva of the lower lid, white dots, about 0.1*mm* in diameter, either scattered, or collected into small groups. In the course of a few days, these points increased in number, forming small snow-white patches, arranged mostly in groups of three. Each patch had a diameter of

about 0.5*mm*, and was rounded or slightly oval in outline. These spots, by growth or by coalescence with neighboring spots, formed large white oval or irregular patches (Fig. 1). The largest spots were 3–7*mm*, and the smallest 2–4*mm*.

The spots were situated on the tarsal conjunctiva, the fornix, and the lower half of the bulbar conjunctiva. The patches on the tarsal conjunctiva often reached the margin of the lid, and the mouths of the Meibomian glands. The patches were raised not more than 0.5*mm* above the surface of the conjunctiva. None of the spots was ulcerated on the surface, nor was there any desquamation, or contraction of tissue.

If the patches were lightly rubbed with cotton or lightly scraped with a Daviel spoon, no change could be seen. When the patches were so violently scraped that they were torn, they could be partly lifted away, with portions of the adjacent conjunctiva. If a spot was removed with the scissors, the tissue at its base appeared whitish, in the form of a rounded droplet, and the connective-tissue bundles also showed white areas. After complete development of the patches, the hyperæmia of the conjunctiva gradually disappeared. The time required for the development of this disease was from twenty-eight to forty-four days.

(1) The developmental period of the patches was about eight to twelve days. This period was shorter when otitis or menstruation occurred at the same time.

(2) The stationary period, during which the patches, having reached their highest point of development, remain unchanged, lasts about eight to twenty days.

(3) The retrogressive period lasts about twelve days. During this period the patches changed, first in the center to a whitish gray, sometimes slightly yellowish, the white borders appearing more prominent. Then the spots gradually diminished in size.

The development of the patches caused no shrinkage of the conjunctival sac. The portions of the conjunctiva which were not covered by patches had a normal appearance and thickness.

In general, the development of the spots was restricted to one eye, usually the right, and the relapses occurred during five years, from one to three times a year. During the last relapse, which occurred in 1908 in the right eye, there developed, for the first time, on the lower half of the bulbar conjunctiva of the left eye, near the fornix, an oval white patch, 2.5*mm* in its greatest diameter, and another smaller patch in the tarsal conjunctiva, near the edge of the upper lid. While the conjunctivæ of both eyes were affected the corneæ remained clear. The iris was normal. The

pupillary reaction was normal, and the intraocular tension was normal. The eye grounds were normal.

Of the ten relapses in the right eye, seven occurred in winter, two in the fall, and only one at the beginning of summer. The first occurrence in the left eye occurred in winter.

In 1905, she was treated for cervico-endometritis and right-sided ovario-salpingitis, probably gonorrhœal in origin, in the University Gynecological Clinic in Pavia.

During all of the attacks, the examination of the urine and blood was negative. Menstruation was normal, there were no miscarriages, and in 1908, she bore a full-term healthy child, and was kept as a wet-nurse in the foundling asylum at Pavia.

II.

HISTO-PATHOLOGIC FINDINGS.

Histological Examination.—The excised patches were hardened in absolute alcohol, in Flemming's fluid, in sublimate, and in formol. The sections were stained with neutral carmine, with carmine alum, according to Grenacher, with Weigert's picrocarmine, with Busch's hæmatoxylin-eosin, with Unna-Taenzer's acid fuchsin, with Unna-Taenzer's acid orcein, with Weigert–Bizzozero–Ehrlich's hæmatoxylin, with Fischer's eosin, with osmic acid, with Sudan III, with Pappenheim's stain, and with Nicoltes' thionin.

The histological examination of the patches gave the following results: The epithelium of the bulbar conjunctiva is almost everywhere of normal thickness (Fig. 2a, Fig. 4a); in a few places, in the tarsal conjunctiva and the fornix (Fig. 2b), it is somewhat diminished in thickness. In the upper and middle layers of the epithelium, there are scattered lacunæ, containing remnants of epithelial cells and polynuclear leucocytes; cells in the process of karyokinesis are seen in the middle layers; there is infiltration of lymphocytes in various epithelial layers.

The changes in the connective tissue are identical in the patches on the scleral conjunctiva and in those of the fornix and the tarsus. There is seen, in the connective tissue under the epithelium, a marked infiltration with mononuclear leucocytes (Fig. 2c), seldom with polynuclear leucocytes;

in some areas there are numerous mast cells (Fig. 3a, Fig. 4b); there are very few plasma cells. The leucocytic subepithelial infiltration is not more marked than the accumulation of connective-tissue cells.

The connective-tissue bundles in the middle of the stroma of the patches are mostly split, or form a loose network (Fig. 3b), with wide lymph spaces (c); between the connective-tissue bundles, there are mast cells (d), which are numerous in some regions, but fewer in number near the vessels; there are also seen, here, a few plasma cells and fat-cells arranged in series.

In the middle and deeper layers of connective tissue, mast cells are seen (Fig. 4c), either singly or in groups, of larger volume and irregular polyhedral form. In these groups, the nuclei have a shining gold-yellow color. These nuclei cannot be stained either with the various hæmatoxylins, with carmine, or by Pappenheim's method.

In the advanced pathological process, the mast cells seem to be reduced to granules, which lie in the interstices of the connective-tissue stroma, and mingle with the yellow granules (Fig. 4d), and with the fine pale white granules, which take their origin from the changed blood-elements, and are scattered in little heaps in the interstices of the connective tissue. In sections, these yellow and white granules, treated with a 20% aqueous solution of potassium-ferro-cyanide, give a positive reaction for hæmoxiderin, turning light blue.

With Ehrlich's hæmatoxylin, they became pale blue; with Weigert's picrocarmine, they became gold yellow; with carmine-alum, black; with acid-fuchsin, the yellow granules retained their color.

Most of the vessels are dilated; the adventitia of the arteries and veins is infiltrated with mononuclear leucocytes, plasma cells, and mast cells. The epithelium of the intima of many of the large and small veins shows a dark yellow pigmented protoplasm (Fig. 5a). The nuclei contain no pigment. The lumen of the vessel shows, in some cases, altered blood-elements and a network containing a few leucocytes and some pale glittering granules, which also occur outside of the vessel, in the adjacent connective tissue.

In the connective tissue of the patches which lie in the

tarsal conjunctiva, there are seen, near the roots of the lashes and the Meibomian glands, accumulations of fat-cells, arranged in rows, while the lashes with their sebaceous glands, the Meibomian glands, and Krause's glands show no pathologic changes.

HISTO-CHEMICAL EXAMINATION.

(1) Reaction for fatty degeneration.—With Sudan III, the deeply situated connective-tissue bundles of the patch take on a pale orange color; some become waxy in color. With osmic acid, the reaction is positive in circumscribed spots in the connective-tissue stroma of the conjunctival patches of the fornix and tarsus.

(2) Reaction for glycogenic degeneration.—Negative with iodine and KI, as well as with rosanilin mur.

(3) Reaction for amyloid degeneration.—With iodine-green, the connective-tissue bundles in some of the sections became pale violet. This is positive proof of circumscribed amyloid degeneration, because the remainder of the sections showed a negative reaction, viz., dark blue and in some places green.

(4) Reaction for hyaline degeneration.—Negative.

(5) Reaction for mucous degeneration.—On staining with muco-hæmatin, the mucous degeneration was shown to be limited to a few points in the epithelium.

BACTERIOLOGICAL EXAMINATION.

A—With smear preparations, taken with a platinum loop from the surface of the conjunctival patch, and stained after Ziehl and Gram, there were found staphylococci, arranged like bunches of grapes.

B—In sections stained after the method of Pick-Jackson (methylene blue and carbol-fuchsin) and after the method of Ziehl, the staphylococci were seen scattered on the surface of the epithelium covering the patches.

Examination for spirochæta pallida after the methods of Giemsa and Levaditi were negative.

C—Cultures were made from material obtained with a platinum loop from the surface of the patches. The cultures were made on potatoes, agar-serum, gelatine-serum, and

bouillon. On potatoes and agar-serum, the staphylococcus albus was grown. In gelatine-serum and bouillon the cultures were negative.

In 1908, cultures were made in the same media, by placing a portion of the patch into the medium. As in the previous cultures, there was developed the staphylococcus albus on potatoes and agar-serum.

D—Inoculations of positive culture material into the conjunctiva and cornea of guinea-pigs. With a sterile discission-needle, the pure culture of staphylococcus albus in agar-serum was carried over into the conjunctiva of the globe and fornix as well as into the cornea of healthy guinea-pigs. In each guinea-pig, the material was injected into the cornea of one eye and the conjunctiva of the other. For twenty-four to thirty hours after the inoculation into the bulbar conjunctiva, there was seen the mark of the trauma, with a slight reaction. In the fornix nothing could be seen. On the cornea, a traumatic ulcer with a grayish margin appeared, which, in the following days, took on the appearances of a superficial ulcer with a grayish base. There was no iritis.

Ten to twenty days after the inoculation, nothing was to be seen on the bulbar conjunctiva and the conjunctiva of the fornix. The corneal ulcerations cicatrized after the thirtieth day, leaving a white macule. Bacteriological examination of the grayish material in the corneal ulcers showed the presence of staphylococcus albus in small numbers.

III.

It has been determined by ophthalmologists that the conjunctiva participates in the pathological processes of roseola, scarlatina, and small-pox, just like the other mucous membranes. During these diseases there are seen in the conjunctiva, hyperæmia, catarrhal and purulent manifestations. Hay-fever is accompanied by an intense acute conjunctivitis. Trousseau described a variety, a periodic conjunctivitis, which occurred in a twenty-two-year-old woman a month after the onset of the hay-fever. In this patient there occurred, before the development of the conjunctivitis, dry eczema, localized edema, urticaria, hay-fever once a year, gastro-pyloric disturbances, and muscular or

articular rheumatism. The conjunctivitis was preceded by nausea, migraine, edema of the scalp and other parts of the body, in the form of plaques. Then the bulbar conjunctiva became reddened, and there were noticed grayish-pink elevations, which spread out under the lids. These nodules always lay near the fornix, and fused into a mammillary-shaped prominence, 6*mm* wide and 3–4*mm* high. On the contiguous conjunctiva, the papillæ were hypertrophied. The prominence was freely movable on the eyeball, and was insensitive to pressure. There was no conjunctival secretion. The mass usually disappeared in fifteen to twenty days, sometimes in one to two months. The urine always contained a large amount of uric acid.

Microscopic and bacteriological examination excluded tuberculosis. The connective tissue was infiltrated with mononuclear leucocytes, which were arranged in nodules around the vessels and mast cells. There were new-formed blood-vessels, which lay upon the epithelial layer. Trousseau concluded that it was rather a nutritive disturbance than an infection.

Differential Diagnosis.—Ophthalmia in the form of conjunctival patches differs from the following conjunctival affections:

(1) From membranous, non-diphtheritic conjunctivitis with the presence of staphylococci or streptococci, and from membranous diphtheritic conjunctivitis, with the presence of the Loeffler bacillus: (*a*) through the clinical and anatomical appearances, as the conjunctival patches were never covered by a membrane, and were produced by histologic and histochemic changes of the tissues of which the conjunctiva is composed; (*b*) by the lessened virulence of the staphylococcus albus, when inoculated into the conjunctiva and cornea of guinea-pigs, as the same organisms were found in almost pure culture by Jessop in the membranes of certain non-diphtheritic membranous conjunctivitides, with intense virulence; although it must not be forgotten that the same staphylococcus albus was found by various observers (Fick, Gayet, etc.) in the normal conjunctiva.

(2) From pemphigus, by the fact that in ophthalmia in the form of conjunctival patches there are no vesicles containing

fluid, no ulcers, and no shrinkage of the conjunctival sac, and because the cornea was not involved by the disease.

(3) From erythemata, mucous patches, gummata, and syphilitic ulcers, by the clinical manifestations, the histologic and histo-chemical structure, as well as the negative findings as regards the spirochæta pallida. Furthermore, the history and examination of the patient were negative as regards syphilis. The patient never aborted, and was delivered of a healthy child. Finally the condition was not influenced by mercurial treatment.

(4) From tuberculous conjunctivitis, by the clinical picture, by the absence of ulcers or losses of substance, by the histologic findings, and by the normal condition of the cornea, in spite of its being in contact with the patches on the tarsal conjunctiva.

(5) From conjunctivitis nodosa, by the histologic structure and the clinical picture, as ophthalmia in the form of conjunctival patches never involves the episcleral tissues or the iris.

(6) From spring catarrh and Parinaud's conjunctivitis by manifestly different appearances.

Prognosis.—Ophthalmia in the form of conjunctival patches never involves the cornea, or extends to other parts of the eye. The visual functions of the eye remain normal. There were several relapses every year. The relapses occurred most commonly in the late fall and winter. At the beginning of a relapse, the patient was usually in a run-down condition.

Outcome.—At the end of a regression, the patches become somewhat smaller. Their seat becomes a dark gray. The patches never disappear altogether.

Treatment.—(*a*) Internally, quinine and arsenic were given for the neuralgia, headache, and otitis. (*b*) Locally, the patches were washed with bichloride 1:5000. A mild conjunctivitis, occurring during one relapse, was treated with 1.5% silver nitrate. (*c*) Although the patient gave no evidence of syphilis, she was given antisyphilitic treatment, locally, by means of subconjunctival bichloride injections under the patches, and generally by means of subcutaneous bichloride injections. This treatment had no effect on the condition. (*d*) The patches were excised.

Excision of the patches in the right eye did not prevent the development of fresh patches, but the excision of the patch in the left eye has cured that eye completely. There has been no recurrence in that eye for two years.

CONCLUSIONS.

The ophthalmia in the form of conjunctival patches, observed by me, differs in clinical appearances, pathogenesis, pathologic, histo-chemic, and bacteriologic findings, from conjunctivitis, pemphigus, syphilis, tuberculosis, ophthalmia nodosa, spring catarrh, and Parinaud's conjunctivitis.

The cornea, sclera, uvea, retina, and optic nerve, as well as the visual perception, remained normal.

No pathogenic connection could be found between the febrile prodromal stage and the development of the conjunctival patches. Ophthalmia in the form of conjunctival patches is caused by degenerative changes of its tissues; in the epithelium covering the patches, there is mucous degeneration. There are uncertain evidences of slight amyloid degeneration. There was some fatty degeneration near the Meibomian glands. Some of the mast cells were in a state of degeneration, as well as some of the blood-elements in the vessels and in the connective tissue.

Bacteriological examination showed the presence of staphylococcus albus. Pure cultures of the staphylococcus albus, inoculated into the conjunctiva and cornea of the guinea-pig, did not reproduce either the clinical form or the pathological changes of this form of ophthalmia.

Bichloride injections under the patches and subcutaneously had no effect on the condition.

The best treatment for this condition is the following:

In the period of development: instillation into the conjunctival sac of (*a*) a 4% boric acid solution, or bichloride 1:5000; (*b*) when there is much photophobia, instillation of 1% pilocarpine mur.; (*c*) permanent bandage; (*d*) when there is pain in the eye, instillation of cocain or tropococain 3½ %, and the internal administration of quinine and arsenic.

In the retrogressive stage: continuation of the above mentioned antiseptic instillations, without the bandage.

The operative removal of the patches which are surrounded by other patches is not to be recommended, as this is usually followed by the formation of new patches in the neighborhood. If, however, only one, or a few patches exist in an otherwise healthy conjunctiva, the prompt removal of the patch or patches may cure the condition and prevent relapses.

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EXPLANATION OF THE PLATES.

Fig. 1. Clinical picture of ophthalmia in the form of conjunctival patches, with its localization in the conjunctiva of the globe, tarsus, and fornix. About double enlargement.

Fig. 2. Horizontal section of a patch, which lay partly in the conjunctiva of the fornix, and partly in that of the globe. Stained after the

method of Pappenheim. Zeiss, Ocul. compens. 8. Tube raised 16*mm*. Ob. aa. Small drawing apparatus of Abbe. Drawing tablet after Bernhard. (*a*) Epithelium of normal thickness in that portion of the patch which lay in the bulbar conjunctiva; (*b*) Epithelium reduced in thickness, in that portion of the patch situated in the fornix. Intense subepithelial infiltration with leucocytes, and presence of mast-cells.

FIG. 3. Horizontal section of a patch in the bulbar conjunctiva. Stained after Pappenheim. Zeiss, Ocul. compens. 18; tube raised 16*mm*. Obj. apochrom. DD.

(a) Mast-cells in the subepithelial infiltration of leucocytes.

(b) Split bundles of connective tissue and wide lymph-spaces (c).

(d) Connective-tissue bundles with mast-cells.

FIG. 4. Horizontal section of patch on bulbar conjunctiva. Stained after Pappenheim. Zeiss. Ocul. compens. 18. Tube raised 16*mm*. Obj. apochrom. DD.

(a) Normal epithelium.

(b) In the middle and deeper layers of the connective-tissue stroma. Mast-cells which show a part of their golden-yellow granules.

(d) Accumulations of golden-yellow granules in the connective tissue.

(e) Fine pale granules in the connective tissue.

FIG. 5. Horizontal section of portion of patch in conjunctiva of fornix. Stained with acid fuchsin after the method of Unna-Taenzer. Zeiss, Ocul. compens. 18. Tube raised 16*mm*. Obj. apochrom. 16*mm*.

(a) Epithelium of the tunica of a vein, which contains dark yellow pigment in its protoplasm.

REPORT OF THE PROCEEDINGS OF THE SECTION ON OPHTHALMOLOGY OF THE NEW YORK ACADEMY OF MEDICINE.

By Dr. MARTIN COHEN, Secretary.

MEETING OF MARCH 17, 1913. DR. J. R. SHANNON, PRESIDENT, IN THE CHAIR.

Dr. Jackson M. Mills presented a case of **congenital melanosis of the cornea.** There was a vertical, spindle-shaped brownish deposit in the deeper layers of both corneæ, consisting of minute dots, dense at center and more isolated at margin. No evidence of previous inflammation. The symmetry and characteristic appearance justify the conclusion of its being a congenital melanosis of the cornea.

Its production has been explained by Krukenberg, Stock, and others, by assuming that at a certain period of development the pupillary membrane is in contact with the cornea and becomes absorbed, but the pigment remains and penetrates the cornea. This is borne out by cases with a persisting pupillary membrane connecting cornea and iris.

Dr. John R. Shannon asked whether the condition was bilateral, and also remarked that there was brown pigmentation of the cornea present as in Dr. Woodward's case presented at a previous meeting.

Dr. Percy Fridenberg considered the condition due to uveal pigment, regardless of the color of the iris.

Dr. W. B. Weidler had observed a similar case in his practice.

Dr. Mills next presented a case of **cataract produced by electric shock,** in a brakeman, aged 28. His head having come in contact with the overhead electric wire, while patient stood on the iron steps on top of his car, he received a shock of 11,000 volts. He was unconscious for seven hours and

spent 2½ months in the hospital. Loss of sight in left eye seven months after accident, also in right eye the month following, the only part affected being the lens. The center of the anterior capsules suffered most, being quite dense with a grayish-white, irregular opacity. Dotted opacities and striæ in the periphery. Left iris adherent to the capsule at temporal margin. As sight amounted only to counting fingers, Dr. Mills decided on discission and linear extraction, although the left lens was still immature one year after the accident. The operation was followed by glaucoma, but eventually resulted in $V = \frac{20}{30}$.

Dr. W. B. WEIDLER presented a case of **blepharochalasis** in a white girl, aged 14. Personal history negative. The upper lids became affected after severe sun-burn about three years ago.

The lids are slightly pinkish-red, hanging down in a pouch-like mass, the veins being rather prominent; on palpation the lachrymal glands are displaced downward and outward. The baggy, pouch-like mass of relaxed skin and subcutaneous tissue hangs down below the edge of the lid.

Wassermann, v. Pirquet, and urine negative.

This condition is different from ptosis adiposa, elephantiasis, or bilateral enlargement of lachrymal glands. It occurs most often in young girls, appearing usually at the age of 14, and is always limited to the upper lids.

Dr. PERCY FRIDENBERG remarked that these patients had a peculiar appearance which somewhat resembled ptosis adiposa.

Dr. WOOTTON had treated a similar case by removing an elliptical skin area.

Dr. THOMSON had observed a case of the same description following erysipelas which gave rise to lymphatic stasis. The treatment was surgical, but unsuccessful.

Dr. WEIDLER held that the atonic condition was due to a relaxation of the skin and subcellular tissue.

Dr. H. H. TYSON presented a case of **retraction of globe on attempted adduction** in a girl of 10 who had applied at the N. Y. Ophth. and Aural Inst. for glasses on account of weak vision. There was divergent strabismus of the left eye and enophthalmos of the right. On testing motility of the eyes

to the right, the right eye came forward and the palpebral fissure widened, while the left eye turned in with intermittent nystagmoid movements. In looking straight forward, the right eye tended slightly upward and was retracted with narrowing of the fissure, while the left eye tended to diverge with horizontal nystagmoid movements.

In looking to the left, the right eye retracted about 3*mm*, tending slightly upward, the fissure becoming narrower. The left eye turned well outward. On attempted convergence, the same movements occurred in the right eye, when it fixed with divergence of the left.

Citing Silex and Wolff as to the probable underlying pathological causes, Dr. Tyson said he agreed with Wolff as to the causes of the retraction and narrowing of the fissure, but as to the upward and downward turning of the eyes "being due to displacement of the orbital contents and the position of the optic nerve," he thought a better explanation might be found by considering the position and insertion of the fibrous band and opposing muscles and their lines of traction with varying amounts of innervation, as there are cases of paresis of externi and interni with a different level of the eyes, without causing any suspicion of changed position of orbital contents.

Dr. JOHN R. WHEELER called attention to the importance of the action of the oblique muscles in these cases which should not be overlooked.

Dr. PERCY FRIDENBERG asked whether any bilateral cases had been reported.

Dr. TYSON, in closing, answered in the affirmative, adding that there were also cases described in the literature in which the eyes looked downward, while in others they looked upward.

Dr. FRANCIS W. SHINE presented two cases of **vernal catarrh treated with radium.** In the first case, which had been shown five years previously, the right upper lid had remained smooth after treatment with radium by Dr. Abbe. The left upper lid had been treated over a period of three years once a month during the fall and winter, the exposures lasting from 10–15 minutes. The lid had become smooth but for a small tag of granulations at the inner extremity of the lid.

In the second case both lids had been treated by Dr. Abbe with about five exposures during the fall and winter of 1912 and 1913 and had greatly improved. Both cases were extreme types of the hard, flat, fibrous granulation.

Dr. JOHN R. WHEELER had observed the progress of this case and its excellent result.

Dr. SHINE next presented a case of **cyst of the vitreous.** Patient, female, about 28, complained of headache and was admitted to Dr. Lambert's clinic at the N. Y. Eye and Ear Infirmary. O. D., simple hyp. astigmatism; O. S., comp. myopic astigmatism.

Examination of fundus of O. D. showed a peculiar cyst of vitreous apparently about twice the size of disk which floated freely about on movements of eyeball, but on cessation of movements always returned to the same point just behind the ciliary body below or slightly to temporal side. The cyst was globular and of a steel gray color and semitransparent. It was probably congenital and composed of epithelial tissue, an outgrowth from ciliary body, which became detached, although the fact that it always returned to the same position suggested a small invisible filament still attached to the ciliary body.

After glasses were prescribed, the asthenopic symptoms disappeared. Patient had never noticed any symptoms due to presence of the cyst.

Dr. FRIDENBERG had seen a very similar case. The cyst was slightly pigmented, had slow motion, but no strand could be observed.

Dr. H. W. WOOTTON presented a specimen of **leucosarcoma of the choroid.** The patient, a woman of 72, stated the eye had been blind for two years and become extremely painful the week previous to examination. The day before admission to the Manhattan Eye and Throat Hospital there had been profuse hemorrhage from the eyeball. There was a rupture of the cornea, occupied by a blood clot. On enucleation the eye was found to contain a white tumor springing from the choroid and occupying the greater part of the vitreous. The tumor proved to be a round- and spindle-celled sarcoma with no pigment in the cells of the sections examined. Doubtless, some pigment existed in the tumor.

Dr. E. S. THOMSON stated that very little extension was seen outside the globe in intraocular tumors, they being recognized earlier at the present time. He had seen one recurrence after a perforation.

Dr. FRIDENBERG asked if this case was transilluminated; melanosarcoma was not transparent.

Dr. WOOTTON also presented the **Stephenson-Wolinski tonometer.** He did not believe Stephenson would claim the same accuracy for his instrument as that of the Schiötz tonometer, but it possessed some conveniences and had given a certain amount of satisfaction in trials at the Manhattan Eye, Ear, and Throat Hospital.

Dr. SCHOENBERG thought the principle on which this instrument worked was wrong, as it depended on springs instead of leverage, as the Schiötz tonometer. He also considered the plate too large and inquired whether both instruments had been applied on the same eye for control.

Dr. EDGAR S. THOMSON presented a case of extensive **wound across the limbus covered by a conjunctival flap.**

Dr. THOMSON next read a paper on **The value of the conjunctival flap in wounds of the cornea and sclera.**

All testimony on the use of the conjunctival flap to protect and aid in the healing of a corneal ulceration or wound is favorable. It has so many advantages and so very few disadvantages that it is difficult to understand why the practice should not be used invariably in a certain class of cases. Wounds of the cornea and sclera do not heal well and have a tendency to gape owing to absence of intraocular pressure, to traction of the extraocular muscles, to extrusion of some of the interior substances, and to flushing of aqueous. In order to combat the dangers arising from spontaneous closing of the wound, the conjunctiva offers the advantage of easily stretching, free blood supply, plentiful fibrinous exudate, all of which furthers healing and limits the inflammatory reaction.

The author proceeds to describe the various methods used and the forms of flaps, pointing out their advantages and disadvantages. The simplest form is the best, and the author dissects up a triangular flap, the apex of which lies close in between the wound and the corneal margin, loosening this flap so as to allow it to stretch readily and then attaching it to

the episcleral tissues on the other side of the wound or on the other side of the corneal margin, if necessary. The flap should not be used, unless it is reasonably certain that infection has not occurred.

Dr. Thomson has followed this method for the past 12 years in about 50 cases and feels sure that the results were better than if he had not used the flap. He has never seen pseudopterygium resulting from it.

There are a few special uses of the flap. In cataract extraction its advantages are numerous and well known. After iridectomy it has the advantage of guarding against prolapse of the iris or inclusions of the pillars.

Needling operations by puncture through the conjunctiva, just beyond the limbus, are more difficult to perform owing to the oblique position of the needle in relation to the membrane, but infection is less liable to occur than in puncture of the cornea.

In the use of the conjunctival flap for the repair of extensive corneal ulceration, the author has but little experience, but it is only advisable when the corneal tissue is not repairing satisfactorily. He has used a bridge of conjunctival tissue in such cases, dragging it across into position with guy sutures after Kuhnt's method. But the flap does not permanently adhere to the cornea and there is apt to be a certain amount of inflammation. Although the method seems to be a good one, the actual conditions rendering it advisable do not often arise.

As regards the general principle of using conjunctival flaps, the results are so very satisfactory that one is constantly tempted to use them more and more, after comparison with marginal wounds treated without flaps.

Dr. H. W. WOOTTON reported good results in fistulæ with the use of the conjunctival flap, while the result in ulcers was poor.

Dr. H. H. TYSON performs a conjunctival flap following cataract extraction.

Dr. DWYER mentioned a case of his, where the cornea and sclera were cut with presentation of the ciliary body which was not injured. He used three catgut sutures in the sclera after dissecting back the conjunctiva, and then sutured the conjunctiva. The result had been favorable.

Dr. SHANNON saw no objection to the procedure.

Dr. FRIDENBERG thought the technique might be improved by a subconjunctival injection, producing a large bleb which would aid in the dissection.

Dr. THOMSON, in closing the discussion, said the flap should be used in clean wounds. Statistics were of little value, there being so many factors to be considered. Granulations would occur in wounds, followed by secondary glaucoma. Some cases would heal spontaneously, but with the use of the flap the results were gratifying.

REPORT OF THE ANNUAL MEETING OF THE OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

The first meetings of this Society under the revised Constitution were held on Thursday and Friday, April 24th and 25th, at the home of the Royal Society of Medicine and at the Royal London Ophthalmic Hospital, City Road, Mr. J. B. LAWFORD, President, occupying the chair.

Mr. FRANK JULER read a communication entitled **Acute purulent keratitis** in **exophthalmic goitre, treated** by repeated **tarsorrhaphy.** The case was discussed by the President, Mr. Juler, Senr. Mr. Coulter, Mr. Leslie Paton, Mr. Priestley Smith, Mr. Treacher Collins, Mr. Jessop, Mr. Bishop Harman, Mr. Inglis Pollock, Mr. Johnson Taylor; and Mr. Frank Juler replied.

Mr. ORMOND read a paper on two cases of **permanent hemianopia following migraine,** the patients being young and apparently healthy persons. He referred to three similar cases recorded by Dr. Thomas, of Boston. Mr. Ormond's first case was that of a woman, æt. 33, who had suffered from sick headaches all her life, and for ten years had been subject to very severe migraine. In September last she had a very severe attack, lasting three to four days, with very marked photophobia, but when she recovered she was unable to see anything on her right side. There were no other nerve symptoms, and she was otherwise healthy. The fundi were normal, and with some hypermetropic astigmatism corrected she had vision $\frac{6}{6}$. There was no defect of the pupil, nor of the extra-ocular muscles. The condition remained unaltered in February last, but she had not had such severe attacks since her loss

of sight. The second case was that of a woman, æt. 32, who had had bilious headaches since 18 years of age. After three such attacks at intervals of a week, she woke up on August 4, 1912, with headache still present, and after running to catch a train she found her sight became misty, and when this cleared, she was unable to see anything on her left side; but, with her refraction corrected, she had quite good central vision. Nothing abnormal could be found in her general condition, but in March last the hemianopia remained, though during the interval she had given birth to a child. Spasm of the retinal arteries was considered to be a possible explanation. Observations had been made in patients temporarily blinded by attacks of migraine, in which a spasmodic condition of the retinal arteries had been seen with the ophthalmoscope. The probable cause of the blindness in these two cases was a spasm of that branch of the middle cerebral artery supplying the visual centre, resulting in a permanent interference with the visual function of that side, and so leading to blindness on the opposite side.

Dr. Gordon Holmes and Mr. Werner discussed the cases.

Dr. JAMES TAYLOR and Dr. GORDON HOLMES read papers on: (*a*) conditions present in several members of a family with **hereditary optic atrophy;** (*b*) unusual conditions associated with **optic atrophy, of the family type.** The first paper gave an account of two families showing a similar defect in vision. In the first family, *D*, the members of only one generation are affected. There are four brothers living, and two sisters; and of the four brothers, three are affected in a similar way, the fields showing the existence of a central scotoma for colors. The disks are pale. In the other members of the family there is nothing to suggest a similar defect. In the eldest of the three affected, the only other symptoms complained of are some weakness in the legs, and occasional difficulty in controlling the bladder. The reflexes are all normal. In the youngest brother, the visual symptoms are the only ones complained of. In the middle brother, besides the visual symptoms there are loss of knee-jerk, and a sluggish reaction of the pupil to light, pains in the legs, and analgesia of the lower limbs—signs and symptoms of tabes dorsalis. In this patient also, there is a definite history of syphilis. In the second

family; *C*, the affection of sight is similar, but it is spread over more than one generation. With pale optic disks in the members affected there is a central scotoma for white and for colors. In one member, optic neuritis was observed eight years ago. In one family, four members are similarly affected, while a fifth has congenital cataract. In a collateral branch, three cousins have suffered, and a sister of these cousins had a large family, one of whom suffers from the trouble. Another died of an orbital tumor. Two other cousins, the sons of another sister, suffered from defective sight, apparently the result of defective development. The points emphasized in the paper are: (1) The co-existence of family optic atrophy with tabes, yet the absence of any apparent effect of the tabes on the optic nerve in the cases affected. (2) The transmission of the optic atrophy in the female line, as shown by the family tree. (3) The occurrence of migraine in several of the patients affected, and its persistence even after practical blindness has been reached. (4) The occurrence of other eye defects in members of the family—congenital cataract in one, an orbital tumor in another, and defective eyes in two others.

At the Thursday afternoon session, Mr. ANGUS MACNAB read a paper on an **operation for the excision of the conjunctival sac and lid margins.** The conjunctiva and lids are cleansed with hydrar. perchlor. 1 in 2000. If there be any discharge from the lachrymal sac, the ordinary operation for its excision should precede the treatment of the conjunctival sac. The lids are scrubbed with ether soap, and the disinfection completed by means of benzine. The rapidity and ease with which the operation is performed will greatly depend on the absence of bleeding, and the manner in which the primary incisions are planned will have a considerable influence on the hemorrhage. A spatula is introduced into the sac, and the lids successively stretched over it as they are incised. He commences with the lower lid, entering the knife about 3*mm* from the lid-margin and opposite the junction of the inner $\frac{1}{4}$ with the outer $\frac{3}{4}$ of its extent, and, cutting freely down on to the tarsal plate, the incision is carried parallel to the lid margin to a point just beyond the external canthus; placing the spatula under the upper lid, a similar incision is made which will meet the former at the external tarsal ligament. These incisions

will pass down into the loose areolar tissue on the surface of the tarsal plates, and into the orbit above and below the external tarsal ligament. A pair of narrow sharp-pointed scissors is introduced with one blade above and the other below the external ligament, and the incisions are joined, some care being observed not to notch the skin at the angle at the same time.

The next step will depend on the condition of the conjunctiva. If it is thickened and glistening white, so as to be readily visible, the edges of the lids can be seized with a vulsellum forceps and drawn inwards and forwards towards the nose, while the conjunctiva is separated from the orbital tissues below with a blunt-pointed scissors, until the mass only remains attached at the inner $\frac{1}{4}$ of the lids, which was not incised at the commencement of the operation.

If the conjunctiva be thin, redundant, folded, and hyperæmic, as is often the case, it would almost certainly be buttonholed by such a procedure, and it is far better to introduce the left forefinger into the conjunctival sac and, thus stretching the membrane, separate it from the orbital tissues with the scissors. In these cases there will always be a rather free venous oozing, but as the dissection can be carried out by touch this can be neglected until the sac is thrown inwards, when a pad wrung out of hot water will usually leave the wound dry. The original incisions are now completed by means of a sharp-pointed scissors, one blade of which is passed under the skin, and the cuts made so that the lines of the first incisions are continued till they meet just beyond the internal canthus. The scissors are then rotated about a right angle, and the whole mass, consisting of lid-margins, conjunctiva, and tarsal plates, can be removed by a single cut. At this stage the angular vein will be divided and there will be a free hemorrhage, which can be easily controlled by forceps and ligatures. The wound is then closed by means of four sutures of fishing gut, which pick up the tissues at the bottom of the wound; the dressing is covered with a large pad of wool and a light-pressure bandage. Healing almost invariably occurs by first intention, and there is only a thin scar to mark the site of the operation.

The operation can also be performed when the remains of

a shrunken globe are present; in such cases the globe is pulled forward and dissected out with the conjunctiva.

In cases where the whole globe is present and the operation is being performed originally instead of the ordinary excision, the incisions are made in the same way as before recorded; the lower lid is then pulled up and the dissection of the tarsal plates and the conjunctiva from the orbital tissues continued up to the attachment of the conjunctiva to the globe, when the capsule of Tenon is opened; the upper lid is then treated similarly, and the excision continued by dividing the muscles and the optic nerve as in the usual manner. The completion of the operation is by separating the mass at its inner part in the manner already indicated.

The majority of my patients have been asylum patients, but I have used the same operation in the case of a malignant growth at the external canthus, which was invading the conjunctiva and the cornea, and in which there was no recurrence one year after the operation. One of my patients had trachoma in both of his empty sockets, which contained the remains of sunken globes; here the radical cure of the trachoma was achieved by the excision of both conjunctivæ.

I have been enormously impressed by the relief given to the patients who had discharging sockets, by this operation, and have no hesitation in recommending it to those persons who go about with an empty socket covered with a shade, especially as appearance too is greatly improved by the procedure here related

Mr. N. BISHOP HARMAN read a paper entitled, **An analysis of three hundred cases of high myopia in children, with a scheme for the grading of fundus changes in myopia.**

These cases were collected during educational work in London, and all belonged to the elementary schools, so were socially of the working classes. All had come under observation in connection with the new schools for myopes; many had been watched for several years. Out of the 300, boys were 46%, girls 52%, a difference of 6%, which agreed with the difference in the sexes in ordinary vision tests. The bulk of the cases seen were aged 8 to 12 years. Cases in the earlier years were nearly all boys, which suggests a greater care by mothers for their men-children. The degree of myopia ranged from 4 to

25 D; the bulk—64%—were 6 to 12 D. The extreme degrees, were nearly all in girls. Hereditary influence was marked in 9%. Astigmatism, which the author considered a most likely exciting or adjuvant cause of myopia, was present in 64 %, a far higher proportion than in other defects. Previous keratitis was found in 11%. Congenital defects, such as albinism, coloboma uveæ, dislocated lenses, aniridia, existed in 5%; squint in 4%; nystagmus, mostly associated with bad vision, in 7%. The lens had been removed by operation in 3%, but the improvement of vision was not great.

Dealing with fundus conditions, Mr. Harman criticised adversely their present nomenclature for changes about the disk. He proposed that the fundus should be spoken of as first, second, or third degrees, according as the atrophy at the disk was as wide as one half the disk diameter, the whole diameter, or greater than that. To this would be added other details about the macula, etc. He showed a chart giving the correlation of refraction and fundus change; according to this plan, it bore out his contention. He maintained some definite notation was necessary when these cases came under observation for a definite object, such as the regulation of education.

Grave cases, with lens changes, vitreous opacities, or detached retina, numbered 8 cases, or less than 3%; of these, 3, or 1%, went blind, two of them probably by injury to their fragile eyes.

A chart was exhibited showing the changes in the myopia of 80 children who had received special education over several years; the number of stationary cases seemed to show these arrangements were of value in the control of the condition.

The next communication was by Mr. TREACHER COLLINS and Mr. HUDSON, on the **pathological examination of an eye with congenital anterior staphyloma.**

It was illustrated by a number of slides. Mr. TREACHER COLLINS followed with a paper dealing with **fibrous tissue formation** in connection with the **fibro-vascular sheath** and **visible vessels** on the **surface of the iris.**

The communication was discussed by Mr. Jessop, Professor Straub (Amsterdam), and Mr. G. Coats. Mr. Collins replied.

Abstract of a paper by Mr. E. ARTHUR DORRELL, on the **sensory pupil reflex in tobacco amblyopia:**

The dilatation of the pupil obtained when the skin of any part of the body was stimulated was either in abeyance or obtained only by increased stimuli in tobacco amblyopia.

One hundred cases were examined by him. The lowest stimuli that gave dilatation in the normal eye were obtained from 5 to 7 cells of a constant-current battery, 5 cells of which gave approximately 3.5 milliampères, the negative electrode being applied to the side of the neck.

The cases were divided into three classes as follows:

Class A. Ordinary unselected cases, showing no signs of nervous disease and not suspected of tobacco poisoning.

Class B. Cases suspected of tobacco poisoning and showing no signs of nervous disease.

Class C. Cases showing signs of nervous disease.

In Class A, 58 eyes were examined, with the result that in 89 per cent only 5 to 7 cells were required to produce the reflex.

In Class B, 121 eyes were examined, and in only 20 per cent was dilatation obtained with 5 to 7 cells, and in over 50 per cent of the remaining 80 per cent no dilatation was obtained at all, with the strongest stimulus the patient could stand.

In Class C, 18 eyes were examined, and in only 22 per cent was the reflex obtained with 5 to 7 cells, and over 75 per cent of the remainder gave no dilatation.

Owing to the similarity in the results in Classes B and C, this test was not a positive sign in favor of tobacco poisoning alone, but should be included in the symptom-complex of locomotor ataxia and allied affections of the spinal cord.

Friday morning was occupied with the discussion of the subject, **vascular and other retinal changes in association with general disease.**

Dr. James Taylor opened the discussion by referring to the wide scope of the subject, and said he thought it would be impossible to discuss it fully in a manner which would be instructive. So he proposed to direct particular attention to thrombosis, or embolism of retinal vessels, and to raise some points in reference to other conditions embraced in the title of the discussion.

Dr. Taylor asked first as to the prognosis in albuminuric cases, and referred to the short duration of certain cases and the length of life in others. He mentioned a case of albuminuric retinitis which he observed during five years before death occurred. He referred also to diabetic cases and mentioned a case in which the condition had existed during eight years, the patient being still alive. The condition of "silver wire" arteries described by Marcus Gunn was also alluded to, and a case, seen by Gunn and diagnosed by him, was mentioned as being still alive after nine years. Dr. Taylor then referred to four cases with the ophthalmoscopic appearance of embolism of the central artery of the retina. In two of these, heart changes were present: in two, no such changes existed and there was no albuminuria. Reference was made to the frequent occurrence of the characteristic ophthalmoscopic appearance of embolism of the central artery in which no heart disease could be discovered. Such were probably thrombotic.

Eight cases of venous thrombosis were then described. In seven, albuminuria with an hypertrophied heart was present; in several, both conditions. One is alive and in fair health after two years.

A brief reference was made to retinal hemorrhage resulting from syphilitic disease—not a very common condition.

Dr. Taylor concluded by expressing the opinion, gained from the experience which his colleagues at Moorfields had afforded him, that in most cases of venous thrombosis cardiac hypertrophy and vascular disease are usually present. Albuminuria also may be present. In his experience venous thrombosis is not very common in glycosuric cases. The prognosis in such cases is bad, yet exceptionally the duration of life after venous thrombosis is much longer than one would naturally expect, and reference was made to a case seen by Mr. Morton six years ago, with venous thrombosis, who is still alive and well with good vision.

Mr. L. WERNER (Dublin) dealt with the subject **angiosclerosis** chiefly from the clinical and ophthalmoscopic points of view. The ophthalmoscopic evidences of the disease were first considered and discussed. The necessity of an ophthalmoscopic examination in cases of suspected angiosclerosis

in general practice was emphasized and some cases were related illustrating several points of interest.

Obstruction of the retinal circulation was next treated of in connection with two cases illustrative of different types of disease.

The first was one of embolism of the inferior temporal branch of the central artery, occurring in a gentleman aged about 48. The upper nasal quadrant of the field of vision was suddenly lost. A white plug was seen in the affected branch of the artery, which was almost empty below it. The central vision, however, was never impaired and was still normal fifteen months later. A few days after the attack, medical examination revealed the presence of a mitral valvular lesion.

Mr. Werner's second case was an unusual one of obstruction of retinal circulation in both eyes in a boy aged 11. The left eye became suddenly blind while he was at his lessons, and three days afterwards the sight of the right eye went in a similar way.

The ophthalmoscopic signs were those of blocking of the central artery with breaking up of the blood column in the vessels. In the second stage the left optic disk became swollen to such a degree as to resemble a choked disk and, in both eyes, white stars of exudation developed at the macula. Perception of light was absent in the right eye for twelve days and in the left for four, nevertheless vision improved to $\frac{6}{36}$ in the former and to $\frac{6}{24}$ in the latter.

The diagnosis was discovered and strong evidence brought forward to show that the disease in this case was tuberculous in origin.

In conclusion the interesting subject of sudden temporary obscurations of sight was referred to. The ophthalmoscopic appearances observed during the attacks were summed up, and the cause discussed, including the theory of arterial spasm.

Mr. GEORGE COATS described first the **normal structure of the central artery and vein,** and pointed out that in passing through the lamina cribrosa the elastic membrane of the artery breaks up into a feltwork of fine fibrils, while in the case of the vein elastic tissue disappears entirely from the wall. The normal central vein is little more than an endothelium-lined channel in the tissues.

Disease of the central artery takes the form of a deposition, on the inner aspect of the elastic membrane, of a new tissue composed in varying proportions of cells and fibrils, which encroach on the lumen, usually in an eccentric manner. The elastic membrane itself is often thickened, and elastic fibres are an important constituent of the new tissue. Both the cells and fibrils tend to undergo degeneration; the cells become swollen and fatty, the fibres indistinct and hyaline. Finally by breaking down, debris-filled cavities may be formed. These changes are always greatest in the outer layers of the new-formed tissue.

The primary lesion is probably a proliferation of the endothelium; in the normal central artery of a young person no other tissue is visible within the elastic membrane. The elastic tissue is probably a derivative of these proliferated cells, the case being analogous to the laying down of new layers of the membrane of Descemet by the endothelium of the anterior chamber.

Evidence of primary disease of the central vein is very rare even in cases of obstruction of that vessel. Thickening and infiltration of the wall occur, but not usually at the site of obstruction; they are therefore probably secondary, not primary and the cause of the block.

In the retinal vessels, the commonest form of disease, at least in cases of obstruction of the central vein, is a thickening of the fibrous tissue of the wall—fibrosis. This is the same condition as is found in the central vein, but it differs from the commonest type of disease in the central artery, the change affecting the intima in the central, the media in the retinal, arteries. Endothelial proliferation is also found, but more rarely.

It is not improbable that endothelial proliferation is a response to the stimulus of a circulating toxine; fibrosis, a strengthening of the vessel wall to resist increased blood pressure. Hence the frequency of fibrosis in the retinal vessels, which are badly supported and liable, when glaucoma is present, to be nipped at the edge of the cup.

It is probable also that endothelial proliferation is represented in the ophthalmoscopic picture by irregularities of calibre without much apparent change in the vessel wall,

while fibrosis, by increasing the reflection from the wall, causes brightening of the reflex (silver wire arteries), and in more advanced stages white lines along the vessels.

Mr. Coats also demonstrated the pathological features of some cases of obstruction of the central vein, and showed that in early stages a homogeneous thrombus might be found, which subsequently undergoes invasion and organization from the surrounding connective tissues, or sometimes from the endothelium. Probably the primary cause of most of these cases is interference with the circulation due to arterio-sclerosis. Cases occur, however, in which there seems to be a true inflammatory affection of the vein wall, and this accounts for some of the instances in which young persons are attacked.

Two cases were also demonstrated which proved that not all cases of arterial obstruction are due to endarteritis and thrombosis, but that the condition may be due to embolism.

The discussion was continued by Mr. Priestley Smith, Professor Straub, Mr. Bishop Harman, Mr. Richardson Cross (Bristol), Dr. Leighton Davies, Dr. Gray Clegg (Manchester), Mr. Whitehead (Leeds), Dr. Gordon Holmes; and the openers replied.

In the afternoon an extensive series of cases was exhibited and discussed at the Royal London Ophthalmic Hospital. During the congress the members dined together.

QUARTERLY REVIEW OF THE PROGRESS OF OPHTHALMOLOGY

By H. KOELLNER, Berlin; W. KRAUSS, Marburg; R. KÜMMEL, Erlangen; W. LOEHLEIN, Greifswald; H. MEYER, Brandenburg; W. NICOLAI, Berlin; H. PAGENSTECHER, Strassburg; K. WESSELY, Würzburg; and M. WOLFRUM, Leipsic, with the Assistance of ALLING, New Haven; CALDERARO, Rome; CAUSÉ, Mainz; DANIS, Brussels; GILBERT, Munich; GRÖNHOLM, Helsingfors; v. POPPEN, St. Petersburg; TREUTLER, Dresden; and VISSER, Amsterdam.

THIRD QUARTER, 1912—(*Continued*).

Edited by Dr. MATTHIAS LANCKTON FOSTER, New Rochelle.

IV.—METHODS OF RESEARCH, REMEDIES, INSTRUMENTS, AND GENERAL OPERATIVE TECHNIQUE. Reviewed by LOEHLEIN.

311. AUGSTEIN. **A simple method of testing the pupillary reaction by means of two concave mirrors of different strengths.** *Klin. Monatsbl. f. Augenheilkunde*, Sept., p. 366.

312. BEAUVIEUX. **Tuberculin and ocular tuberculosis.** *Arch. d'ophtalm.*, xxxii., p. 549.

313. v. BLASKOVICS, L. **A new way of fixing the eyeballs of patients who cannot look downward.** *Zeitsch. f. Augenheilk.*, xxviii., No. 2.

314. DARIER. **Tuberculin in ocular therapeutics.** *La clinique ophtalm.*, iv., p. 394.

315. VAN DOREN. **The use of fibrolysin in ophthalmology.** *Arch. med. belges*, August, 1912.

316. GRADLE, H. S. **Tonometry, with a description of a tonometer.** *Ophthalmic Record*, Sept., 1912.

317. v. LIEBERMANN, L. **Recent experiences with tuberculin.** *Zeitschrift f. Augenheilkunde*, xxviii., Nos. 2 and 3.

318. WOLFF, HUGO. **Correction of anisometropia in aphakia by means of Zeiss's double system of lenses.** *Ibid.*, Aug., Sept., p. 149.

AUGSTEIN (311, **Method of testing the pupillary reaction**) uses, to test the reaction of the pupil to light, the mirror of the ophthalmoscope and a reflector, such as is used by otologists. The ophthalmoscope, at the distance of 40*cm* from

the patient, serves to illuminate the pupil sufficiently to allow the behavior of the iris to be observed while stronger light can be thrown into each eye in turn with the reflector. In doubtful cases the iris can be watched with Zeiss's corneal microscope while the light is thrown into the eye with the reflector.

GRADLE (316, **Tonometry, with a description of a tonometer**) has devised an instrument which is an improvement over the Schiötz tonometer in the following particulars: The foot plate is 3*mm* smaller, thus enabling the operator to see the pupil and to accurately gauge the position; the radius of curvature is 7.6*mm* instead of 8.4*mm*, which more nearly approximates the corneal curve; the diameter of the stylet is smaller and brings the weight nearer to a mathematical point, and the weights are more readily applied.

ALLING.

WOLFF (318, **Correction of anisometropia in aphakia**) reports the case of a woman 20 years old who had had for 8 years monolateral aphakia in consequence of a traumatic cataract. The vision of the eye was $\frac{6}{6}$ with +12 D. In spite of the high degree of anisometropia he was able to secure good stereoscopic vision with the aid of Zeiss's double system of lenses, which made the retinal image in the aphakic eye of the same size as that in the normal one.

V. LIEBERMANN (317, **Recent experiences with tuberculin**) prefers the bacillus emulsion in tuberculous diseases of the eye, and has used it with excellent results. He advises that the dose be increased very slowly so as to avoid raising the temperature above 37.5°, but considers elevations of temperature of a few tenths of a degree to be no contra-indication.

DARIER (**Tuberculin in ocular therapeutics**) considers tuberculin not to be a curative serum, properly speaking, for the tuberculous process, but a means whereby we can stimulate the power of resistance of the organism to the tuberculous infection. In the past 9 years he has treated 30 cases, 25 with positive, and 5 with negative results; these cases include various clinical forms of chorio-retinitis, iritis, scleritis, keratitis, and detachment of the retina. He thinks the best preparation of tuberculin is the bacillus emulsion. When this is not borne, even in the smallest doses, he uses endotin,

which is identical with tuberculin that is free from albumose, as this causes no rise of temperature. After a while, when the patient has become accustomed to this preparation, he tries the bacillus emulsion again. CAUSÉ.

BEAUVIEUX (312, **Tuberculin and ocular tuberculosis**) speaks particularly of the frequency of tuberculosis as the cause of simple disseminated chorioiditis and recommends, in all cases in which syphilis is excluded by a negative Wassermann and the suspicion is to some degree justified that tuberculosis is present, the careful administration of tuberculin. He gives the clinical histories of 6 cases that illustrate the benefit derived from this treatment. CAUSÉ.

VAN DOREN (315, **Use of fibrolysin in ophthalmology**) obtained a considerable improvement in a case of cicatricial adhesion of the upper lid, and in one of cicatricial entropion. He obtained no benefit in cases of leucoma, in fresh corneal infiltrates, and in parenchymatous keratitis. Opacities of the vitreous were influenced favorably, but the results in cases of old iritic exudates were negative.

In the exceptional cases, in which the patients to be operated on are unable to look downward, V. BLASKOVICS (313, **New way of fixing the eyeball**) recommends to incise the conjunctiva over the superior rectus and to pass a thread through the muscle, by means of which an assistant can control the position of the eye during the operation.

V.—ANATOMY, EMBRYOLOGY, MALFORMATIONS. Reviewed by PAGENSTECHER.

319. HIRSCH, C. **Encanthoschisis and other congenital anomalies of the eye.** *Klin. Monatsbl. f. Augenheilkunde*, July, 1912, p. 1.

320. VAN DER HOEVE, J. **Atypical coloboma of the lens.** *Nederl. Tijdschr. v. Geneesk.*, 1912, ii., No. 7.

321. PALMIERI, L. **Contribution to the study of congenital irideremia.** *Annali di Ottalm.*, fasc., 5-6-7, 1912.

322. POPOFF, E. **Contribution to the study of the plica semilunaris and of the lachrymal caruncle in man.** *Thèse de Paris*, 1912.

POPOFF (322, **Plica semilunaris and caruncle**) has studied the development of the plica semilunaris and the caruncle in sixteen human embryos measuring from 1.5 to 17*cm* long. He found the first signs of the development of the plica in an embryo 1.8*cm* long. The glands of the crescentic fold have

nothing to do with Harder's glands, but belong to those of Krause. The caruncle appeared first in an embryo 4*cm* long; its glands begin to develop when the embryo is 6*cm* long.

HIRSCH (319, **Encanthoschisis and other congenital anomalies**) describes two cases of malformation of the caruncle which he terms encanthoschisis. The caruncle is fissured, either in the form of a notch or of a reduplication. He thinks this malformation is due to amniotic adhesions which, under certain circumstances, may result in total absence of the caruncle.

VAN DER HOEVE (320, **Atypical coloboma of the lens**) reports a case of bilateral, nasal, large, saddle-shaped coloboma of the lens. The fibers of the zonula were absent in the middle, but were clearly to be seen at the two ends. Repeating the experiments of Wessely he performed iridectomies on new-born rabbits and determined the weight of the lens at different ages. The lens in the eye that had been operated on was always the lighter, and the difference was greatest when the operation had resulted in a coloboma. The coloboma of the lens caused by a defect in the zonule was probably a true coloboma and not a simple change in form. VISSER.

PALMIERI (321, **Congenital irideremia**) observed three typical cases of congenital absence of the iris in three members of the same family. The mother, 46 years old, had bilateral congenital irideremia, cataract, nystagmus, and glaucoma. Her right eye was amaurotic. Her 26-year-old daughter likewise had bilateral congenital irideremia, cataract with ectopia lentis, nystagmus, and glaucoma, on account of which the right eye was enucleated. A sister of the latter, 24 years old, had the same conditions of the eyes but the glaucoma in her case was without pain. CIRINCIONE.

VI.—NUTRITION AND INTRAOCULAR TENSION. Reviewed by WESSELY.

323. TOCZYSKI. **The influence exerted by dionin upon the pupils and the tension of normal eyes.** *Zeitschrift f. Augenheilkunde*, July.

TOCZYSKI (323, **Influence of dionin upon the pupils and the tension**) finds that an elevation of the intraocular tension takes place simultaneously with the onset of meiosis 10 or

20 minutes after the introduction of the dionin. The increase amounts to from 5 to 18*mm* of mercury, according to tonometric measurements, lasts about four hours, and then the tension returns to normal, or may become subnormal. The latter symptom does not seem to be absolutely associated with the mydriasis that follows the meiosis, as the mydriasis sets in usually at the time while the tension is still elevated.

VII.—THE SENSE OF SIGHT. Reviewed by KOELLNER.

324. BEHR. **Injuries of the eye by light.** *Arch. f. Ophth.*, lxxxii., p. 509.

325. EDRIDGE-GREEN. **New visual phenomena.** *Journal of Phys.*, August.

326. LOEHNER. **The visual acuity of man and its test. A physiologico-ophthalmological study.** 136 pages. Leipsic and Vienna. F. Deuticke.

327. MARX, E. **Studies concerning the differentiation of depth by the macula and by extra-macular portions of the retina.** *Nederl. Tijdschr. v. Geneesk.*, 1912, ii., No. 7.

328. PICHLER. **The visual field in scintillating scotoma.** *Prager med. Wochenschrift*, 1912.

329. PORTER and EDRIDGE-GREEN. **Negative after-images and successive contrast with pure spectral colors.** *Proceedings of the Royal Society*, B, vol. 85, p. 434.

PORTER and EDRIDGE-GREEN (329, **Negative after-images and successive contrast with pure spectral colors**) wearied the eye with approximately pure homogeneous light of great intensity and then directed it at a spectrum cast upon a screen in a dark room. The negative after-image of the first illumination was then visible over the spectrum as a narrow dark band of the complementary color. The persistence of the after-image was noteworthy; it did not change its color and was not influenced by the variously colored spectral light that now fell at the same time on the retina, unless this was of too great intensity.

EDRIDGE-GREEN (325, **New visual phenomena**) endeavors to support his theory of the perception of color by a number of after-image symptoms which cannot be quoted here in detail. Among other things he has noticed that an after-image loses its form and is distributed over the retina when the patient shakes his head. After looking at a mosaic of red and blue squares the after-images of the red disappear more quickly than those of the blue. Colors also disappear

more quickly in the after-image than the sensation of light and dark. His observations indicate, he thinks, that the photochemic means of stimulation must be situated outside of the elements that respond to the stimulation. This means of stimulation is given in the fluid about the cones, which must excite the sensation of all colors. It is quite probable that the pigment cells take part in the formation of the photochemic agent. He is not aware of any fact that indicates that the rods are percipient elements; on the contrary, he believes that the ends of the cones are excited by the photochemic disintegration of the surrounding fluid. The rods serve only as reservoirs for the visual purple, which plays a part in the sensitizing fluid. In regard to the question whether a Purkinje's phenomenon exists in the fovea or not he says that it depends on the intensity of the light used in the examination; with reduced light it may be demonstrable.

PICHLER (328, **Visual field in scintillating scotoma**) made a number of observations on himself and collated fifty cases. The defect in the visual field was exactly symmetrical in both of his eyes and clung close to the median line. Hemianopic scotomata are, in his opinion, negative. He saw in the relative scotoma peculiar disturbances of the color sense, such as are apt to occur in interruptions of the conductivity of the optic tract; red colors appeared to be yellow, yellow to be pale. As prodromal symptoms transient colored spots were sometimes observed which did not move about in the visual field; the typical attack came on some time after they had disappeared. Whether true disturbances of adaptation occur, remains uncertain. The hemianopic scotoma is not always of the same extent as the scintillating area; in his own case the latter was not as large as the defect in the visual field.

MARX (327, **Differentiation of depth by the macula and by extra-macular portions of the retina**) thinks that sufficient attention has not been paid to the question of the difference between the differentiation of depth by the macula and by other portions of the retina. He experimented with three threads; the middle one was movable in the median, the others in a frontal direction. With the outer threads at varying distances from each other he could tell at a glance whether the middle

thread was in front of or behind the plane of the former. Within the limits of the macula he found no difference, but outside the macula, beginning with an excentricity of 1.5° to 2°, the necessary displacements of the middle thread as the distance between the others increased quickly became greater, and the accuracy of the perception of depth less, approximately in harmony with the excentric diminution of the monocular visual acuity. VISSER.

LOEHNER (326, **Visual acuity**) points out that various things are understood by the term visual acuity, and groups all of its definitions under three headings: (1) the visual acuity is identical with visual capacity in its widest sense; (2) visual acuity corresponds to the perceptive ability of the retina; (3) visual acuity is the product of many factors, including in addition to the latter the dioptric apparatus of the eye and the mechanism of transmission to the central nervous organs. We have first to distinguish, according to Hering, between the *minimum visibile*, the ability to recognize very minute differences in position and size, and the *minimum separabile*, the power to perceive as separate two points or lines, and then we have to add the optic sense of form, the power to distinguish peculiarities or deviations of form (Guillery). At the same time it may happen that persons may have a fine sense of form in whom the visual acuity is impaired. The *minimum separabile* is relatively the easiest to determine. The author then considers the dioptric components of visual acuity, the influence of diffuse and lost light, and that of the size of the pupil, as well as the retinal and post-retinal components, the light and color sense, and the effect produced by prolonged observation. Finally he takes the stand that visual acuity is always the expression of the total of the factors mentioned, including attention, practice, and intelligence, and should not be used as synonymons with the fineness of the *minimum visibile* alone. Hence a number of tests should be employed to determine the visual acuity in various ways.

BEHR (324, **Injuries of the eye by light**) has been able to demonstrate a chronic injury of the eye by artificial light. He observed in four cases a considerable impairment of the adaptation to dark without any objective trouble. The patients complained of scintillations and bad vision on going from the

dark into the light. They had no hemeralopic troubles in spite of the demonstrable disturbance of adaptation. Under the influence of normal illumination the disturbance passed away completely without treatment. Behr names this trouble ophthalmia electrica chronica. He finds that there is always a considerable disturbance of the adaptation to dark in aphakic eyes and concludes that it is caused by the intensive action of the short waved rays.

VIII.—ACCOMMODATION AND REFRACTION. Reviewed by KOELLNER.

330. BETTREMIEUX. **Why the statistics relative to the refraction of school children are so little in harmony.** *Ann. d'ocul.*, cxlviii., p. 192.

331. DOMEC. **Pressure massage and meiotics in myopia.** *La clinique ophtalm.*, iv., p. 474.

332. HOROWITZ. **The influence of coçaine and homatropine upon the accommodation and the size of the pupil.** *Inaug. Diss.*, Berlin.

333. ISAKOWITZ. **Compensation of a mixed astigmatism by the pressure of the finger.** *Meeting of the Berlin Ophthalm. Society*, July 17.

334. VOIROL. **Investigation of the refraction, vision, color sense, and muscle balance in the eyes of 939 school children.** *Zeitschrift f. Augenheilkunde*, xxviii., p. 95.

335. WILSON. **Keratitis as a cause of myopia.** *The Ophthalmoscope*, July.

VOIROL (334, **Refraction, vision, color sense, and muscle balance in school children**) examined 939 children and found that the normal refractive condition of infants, hypermetropia, persists in the early years of school life in more than a third of the children, but later changes to emmetropia and myopia. Corneal astigmatism of over 1.25 D. was present in 15%; astigmatism over this amount, due to cornea, lens, and vitreous, in 13%. The number of cases of astigmatism was greater in the younger than in the older children, whence he concludes that astigmatism tends to gradually adjust itself. Only 14% of the children had vision of less than 1; this was due in one half to astigmatism. The greatest percentage of good vision was among the emmetropes, it was rather less among the hypermetropes, and least among those who were astigmatic. The pupillary distance increases with the age of the child, and is greater in myopia. The refraction was determined with the skiascope, the corneal astigmatism with the ophthalmometer. The most common form of muscular imbalance

was insufficiency of the internal rectus, which was present in 14% of the children. This was more frequent in children who had large pupillary distances than in those in whom the pupillary distance was short. Marked red-green blindness he found in 1.3%, ten times as often in boys as in girls.

BETTREMIEUX (330, **Statistics relative to the refraction of school children**) refers the lack of harmony in the statistics concerning the refraction of school children to the difference in the methods of investigation employed, and also to the method of classification of anisometropes. If in the latter one eye is astigmatic it should be noted as an error of refraction, irrespective of the higher hypermetropia or myopia, because the correction of this is of very great prophylactic importance. Out of 7900 children in the primary schools, 54% of the girls and 46% of the boys had vision less than 1; 35% had astigmatism, 30% hypermetropia, 12% myopia. Bettremieux is for full correction in myopia.

CAUSÉ.

A boy 16 years old had 6 D of mixed astigmatism, according to ISAKOWITZ (333, **Compensation of mixed astigmatism by the pressure of the finger**), which could be compensated by the pressure of the finger. The refraction was + 3 D. − 6 D. cyl. axis 180°. When the eye was pressed by the finger the vision improved from $\frac{6}{60}$ to nearly $\frac{6}{6}$.

WILSON (335, **Keratitis as a cause of myopia**) found myopia in 70% of 100 cases of corneal opacities and therefore recommends that children with phlyctenular and parenchymatous keratitis be kept under observation as long as possible, and that atropine be used carefully.

GILBERT.

DOMEC (331, **Pressure massage and meiotics in myopia**) believes pressure massage used in combination with meiotics and the wearing of fully correcting glasses to be a means capable of arresting the development of myopia. Pressure massage also works well upon myopic changes in the chorioid, and promotes the absorption of opacities in the vitreous. The explanation of its effect that he gives is that the aqueous is driven into the sinus by the slow pressure, dilates the natural passages so that a larger quantity of intraocular fluid is excreted each time than usual. During this treatment,

which is kept up a long time, the zonule becomes more elastic and the ciliary muscle stronger. He also supposes that it has a third effect upon the surface of the retina and chorioid.

CAUSE.

HOROWITZ (332, **Influence of cocaine and homatropine upon the accommodation and the pupil**) has studied carefully the paresis of accommodation and the dilatation of the pupil produced by cocaine and homatropine upon twenty-six persons of different ages. The average results are: with cocaine the paresis of the accommodation begins at the end of 5 or 10 minutes, increases rapidly, reaches its maximum in about half an hour, remains at its acme for 10 or 15 minutes, and then decreases pretty steadily to zero in from an hour and a half to two hours. The paresis is very slight at its maximum with small doses, but may be made total with large ones. The mydriasis reaches its maximum later than the paresis of the accommodation, and the return to normal usually takes 4 or 5 hours. With homatropine the paresis of the accommodation is demonstrable after 10 or 15 minutes and reaches its acme in from $1\frac{1}{4}$ to $1\frac{3}{4}$ hours. It remains at its maximum about $1\frac{1}{2}$ hours, and then gradually retrogresses until the normal range of accommodation is reached in about 15 hours. The paresis is considerable even with a small dose; with a larger dose the entire accommodation may be paralyzed. The dilatation of the pupil outlasts the paresis of the accommodation by some hours.

IX.—THE MOTOR APPARATUS OF THE EYES. Reviewed by KOELLNER.

336. CONZEN and SCHWARZ. **A case of multiple sclerosis with a peculiar disturbance of the ocular muscles.** *Med. Klinik*, No. 35, p. 1444.

337. DEUTSCHMANN. **Ophthalmoplegia interna in childhood.** *Beitraege zur Augenheilkunde*, June, 1912, p. 19.

338. HEIMANN. **Strabismus and its treatment in children.** *Archiv f. Kinderheilkunde*, vol. lviii., p. 72.

339. KORT. **Hysterical spasm of the muscles of the eyeball.** *Inaug. Diss.*, Rostock.

340. KUMAGAI. **A case of paresis of the trochlearis in the course of typhoid fever.** *Zentralbl. f. Augenheilkunde*, vol. xxxvi., p. 262.

341. OHM. **Miners' nystagmus.** *Klin. Monatsbl. f. Augenh.*, July, p. 102.

342. SALUS. **Paresis of the oculomotorius with abnormal cyclic innervation of its inner branches.** *Ibid.*, p. 66.

343. TACKE. **Congenital absence of the inferior rectus.** *Société belge d'ophtalm.*

344. WICHODZEW. **The influence of inclination of the head toward the shoulder upon the movements of the eyes.** *Zeitschrift f. Sinnesphys.*, vol. xlvi., p. 394.

WICHODZEW'S (344, **Influence of inclination of the head toward the shoulder upon the movements of the eyes**) studies took into account the monocular and binocular field of fixation, the divergence, the convergence, the positive and negative vertical divergence, and the symmetric rotation of the eyes about a sagittal axis. These studies have a certain practical interest because many persons have to work lying down, or with the head inclined to one side. He finds that the inclination of the head toward the shoulder produces a uniform diminution of the binocular field of fixation, tested with the perimeter, which grows smaller as the inclination of the head is increased. The cause of this is supposed to be the compensatory rotation of the eyes about a sagittal axis, which changes the relations between the fixation point and the ocular muscles and so restricts the movements of the latter. The monocular field of fixation remains unaffected. The power of convergence decreases as the inclination of the head increases, apparently because of the reflex rolling. The horizontal divergence becomes smaller for the same reason. The positive vertical divergence, *i.e.*, the power to invert the right optic axis over the left, increases with the inclination of the head toward the left shoulder; the negative vertical divergence, *i.e.*, the power to place the right optic axis below the left, increases with the inclination of the head toward the right shoulder. To explain this it must be supposed that the retinal images assume another place, in consequence of the compensatory rotation of the eyes, than that which they occupy when the eyes are vertical. Apparently the ability of the eyes to perform this symmetric rotation about a sagittal axis increases somewhat with the inclination of the head.

OHM (341, **Miners' nystagmus**) finds that this nystagmus is due to a central disturbance of innervation which is usually binocular. There is alternation between vertical and horizontal nystagmus regularly. The seat of the disturbance is thought to be the nucleus of the oculomotorious and troch-

learis; its nature to be a weariness shown by a lessened frequency of stimulation. The cause of the weariness is the constant looking upward demanded by the nature of the work, but the illumination plays an important part. The weariness does not affect the entire nuclear region, but only the parts that govern these particular movements of the eyes. It is more difficult to look upward, physiologically, than to look in other directions, because of a certain muscular insufficiency. For certain forms of miners' nystagmus he suggests that an advancement of the interni may be performed, but he has done so in only two cases.

HUMMELSHEIM.

HEIMANN (338, **Strabismus and its treatment in children**) believes that the cause of strabismus is the partial or total absence of the power of fusion and therefore advocates conservative treatment. A strabismic child should be atropinized as early as possible, and the total hypermetropia completely and permanently corrected. In certain cases it is well to continue the atropine in one eye. When the child is old enough for systematic exercises, at the end of its third or fourth year (?), exercises with the amblyoscope should be instituted several times a week. An operation is indicated when all conservative methods have failed, or when they are hopeless from the start because of a large angle of strabismus, over 15°, or of a high degree of amblyopia of one eye. In such cases it may be performed at the end of the fourth or fifth year. Less is to be hoped from conservative treatment in divergent strabismus. The preferable operation here is advancement of the internus, perhaps with tenotomy of the externus. The latter alone is useless.

SALUS (342, **Paresis of the oculomotorius with abnormal cyclic innervation of its inner branches**) observed an interesting case of this nature in a man 20 years of age. When at rest there was a simple paresis of the oculomotorius, but if the patient was watched carefully the upper lid was seen to rise suddenly with irregular twitchings; at the same time the pupil, which was originally dilated, contracted with fluctuations until it was finally smaller than the other. Coincidently with these movements the refraction of the eye was increased, as shown by the skiascope. The contraction

of the pupil lasted from 10 to 30 seconds. The suggestion Salus makes in explanation of this phenomenon is that there was at an early period of life, or congenitally, an interruption of the conductivity of the nerve trunk close to its exit from the pedunculus cerebri, and that then there was a regeneration of fibers of such a nature that those appertaining to the extrinsic muscles united with those that supplied the internal muscles of the eye, so that the innervations which would otherwise go to the extrinsic muscles alone reach the pupil and the ciliary muscle.

A boy 7 years old suffered from nystagmus and strabismus. TACKE (343, **Congenital absence of the inferior rectus**) diagnosed a paresis of the left inferior rectus and attempted to advance it, but could find no muscle. Correction was secured by tenotomy of the right and left superior recti and advancement of Tenon's capsule.

DEUTSCHMANN (337, **Ophthalmoplegia interna in childhood**) increases the number of reported cases of this condition to fourteen. In all but one a parenchymatous keratitis due to hereditary syphilis was present, and Wassermann's reaction was positive in that one also. As no atrophy of the iris was visible and the sphincter responded promptly to eserine, although cocaine did not dilate the pupil, he thinks the cause was a lesion in the nucleus caused by hereditary syphilis. He propounds the following explanation of its connection with the corneal inflammation: the nuclear affection existed already, but had not yet affected the pupils; the dilatation of these with atropine gave the impulse to render the disturbance manifest.

KUMAGAI (340, **Paresis of the trochlearis in typhoid fever**) reports the second case of this nature on record. The patient, 28 years old, developed diplopia at the end of the third week of the disease. A connection with the typhoid fever was assumed because of the absence of any other cause to explain the paresis. Kumagai thinks the condition was one of toxic peripheral neuritis and not due to any central changes because this was a mild case of fever without any cranial symptoms.

KORT (339, **Hysterical spasm of the ocular muscles**) reports two cases of hysterical spasm of convergence following an injury in each case. The first patient was a girl 19 years old.

When she fixed on a near object, wide horizontal movements of the eyeballs set in, and they finally assumed a position of extreme convergence. All near work was rendered impossible. No other hysterical symptoms on the part of the eyes could be demonstrated. The second patient was a neurasthenic 41 years old. The eyes assumed a position of extreme convergence with annoying diplopia in looking at near objects, which was obviated by closing them. Nothing is said as to the results of treatment in these cases.

In the case reported by CONZEN and SCHWARZ (336, **Multiple sclerosis with a peculiar disturbance of the ocular muscles**) the movements of the eyes to the right and left were slow, as though they were hindered by an obstruction. In diagonal movements the eyes first made the necessary vertical excursion up or down and then moved horizontally toward the object of fixation. Movements up and down were performed with normal celerity. Convergence was little retarded, while the adjustment of the eyes for distance was greatly delayed. There was in addition a bilateral paresis of abduction. As multiple sclerosis was present the author thinks that there was a lesion in the pons, not far from the nucleus of the abducens.

X.—LIDS. Reviewed by KRAUSS.

345. V. BLASKOVICZ. **Rotation of the cartilage of the lid; a new operation for cicatricial entropion.** *Zeitschr. f. Augenheilk.*, xxviii., 2 and 3, p. 286.

346. CHAILLOUX. **Lupus erythematodes of the lid and its treatment with carbonic acid snow.** *Klin. Monatsbl. f. Augenheilk.*, Sept., p. 376.

347. CLAPP, C. A. **A case of gumma of the eyelid.** *Ophthalmic Record*, June.

348. KRAUSS, W. **Ganglioneuroma; a tumor not hitherto observed on the eyelid.** *Zeitschrift f. Augenheilkunde*, August–September, p. 110.

349. ROESSLER, F. **Elephantiasic swelling of the lid after suppuration of the neighboring lymphatic glands.** *Klin. Monatsbl. f. Augenheilk*, September, p. 325.

ROESSLER (349, **Elephantiasic swelling of the lid after suppuration of the neighboring lymphatic glands**) reports a case of this nature met with in a man 18 years old. At first there was a little affection of the skin, through which entered an infection that resulted in the purulent breaking down of the lymphatic glands in front of the ear and along

the lower jaw. This gave rise to an obstruction of the normal flow of lymph, œdema, and finally to a pachydermia lymphangiectatica, as shown by the histological examination of a piece excised from the swollen upper lid. It is also possible that this engorgement of lymph was due to an engorgement in the veins of the face caused by the cicatricial contraction of the skin.

CHAILLOUS (346, **Lupus erythematodes of the lid**) had a patient 32 years old who complained of twitchings of the lids and photophobia. She had previously been treated for lupus of the cheek. The lids were reddened, thickened, and there was a considerable exfoliation of epidermis from the tarsal portion of the lower ones. This he reported as a rare case of lupus erythematodes of the lids, which was materially improved by treatment with carbonic acid snow.

CLAPP'S (347, **Gumma of the eyelid**) patient presented a painful, indurated mass near the inner angle of the upper lid, over which the skin was freely movable. The conjunctiva was thickened over the tumor, which measured 6*mm* by 3*mm*. Incision and curettage brought away only broken-down cellular tissue. Later there appeared an ulcer at the limbus underlying the tumor of the lid. This gradually involved the cornea. As Wassermann's reaction was positive, and as the patient responded immediately to antisyphilitic treatment, he believes the lesion of the lid to have been a gumma or a chancre. The situation and absence of glandular involvement would exclude the latter. ALLING.

KRAUSS (348, **Ganglioneuroma**) excised from the lower lid of a 15-year-old boy a little tumor which proved on histological examination to be a ganglioneuroma. It consisted chiefly of bundles of non-medullated nerve fibers, between which medullated nerve fibers and ganglion cells were to be found. The latter varied greatly in form and size, had capsules and processes, usually contained several nuclei, and exhibited peculiar changes in the protoplasm. The case was considered to be one of true ganglioneuroma, which has never before been found in the lid, starting perhaps from the sympathetic.

V. BLASKOVICZ (345, **Rotation of the cartilage of the lid**) recommends instead of Kuhnt's enucleation of the tarsus

for cicatricial entropion, which presents some disadvantages, a rotation, or inversion, of the tarsus. He has tested the operation in 17 cases and obtained good results. The first part of the operation is performed in the same manner as the enucleation of the tarsus, but before cutting the muscular fibers inserted into its convex margin he introduces sutures into the cut edge of the conjunctiva. Then the muscular fibers are cut at each end of the tarsus, leaving a bundle 3 or 4*mm* broad in the middle. Then the tarsus is rotated until its concave posterior surface is directed forward and returned to its place, where it is secured by means of the sutures.

XI.—LACHRYMAL ORGANS. Reviewed by KRAUSS.

350. BRYAN, W. M. C. **Submucous dacryocystorhinostomy for persistent dacryocystitis.** *Annals of Ophthalmology*, July, 1912.

351. LUEDDE, W. H. **Congenital absence of both lower puncta. Lifelong (double) dacryocystitis. Apparent cure from dacryocystorhinostomy.** *Ibid.*, July, 1912.

352. RHESE. **Rhinogenous involvement of the lachrymal passages, especially the connection of chronic dacryocystitis with diseases of the ethmoid and its treatment.** *Deutsche med. Wochenschr.*, No. 35, p. 1646.

353. TRAPESONZEWA, E. **A case of unpigmented nævus in the region of the punctum lacrimale.** *Westn. Ophthalm.*, August, 1912.

TRAPESONZEWA (353, **Unpigmented nævus in the region of the punctum lacrimale**) found a tumor between 2 and 3*mm* in diameter surrounding the lachrymal punctum of a patient 60 years old. It had appeared within the last four or five months. The microscopic examination revealed accumulations of cells which resembled endothelium, but were in no way associated with it. The cells had large nuclei, contained little protoplasm, stained well, and showed no pathologic changes aside from a rare vacuolization. The heaps of cells were enclosed in a membrane which appeared to be sprinkled with single endothelial cells. These heaps extended like rays from the periphery to the lachrymal canal. No pigment could be discovered in any cell. Otherwise the case resembled the one described by Foerster and may be classified as a lymph-endothelioma. V. POPPEN.

Congenital absence of the puncta may be associated with other embryonic disturbances involving the orbit, but LUEDDE (351, **Congenital absence of both lower puncta**)

has found records of only three cases besides his own in which there were no other abnormalities present. An artificial opening made into the sac did not remain patent. In the total four cases three showed involvement of the lower puncta and only one in which the upper was involved as well.

ALLING.

RHESE (352, **Rhinogenous involvement of the lachrymal passages**) thinks that disease of the ethmoid is much more responsible for chronic dacryocystitis than diseases of the lower nasal passages. He maintains: (1) that chronic dacryocystitis is caused very frequently by disease of the ethmoid, and therefore that the anterior ethmoidal cells have the same relative importance to the lachrymal sac that the posterior accessory sinuses of the nose have to the contents of the orbit; (2) that the prognosis of a chronic dacryocystitis caused by disease of the ethmoid is excellent, as operation on the ethmoid is accustomed to cure even obstinate cases with fistulæ; (3) that even in cases of disease of the lachrymal passages caused by other conditions in the nose the middle meatus is of greater pathogenetic importance than the lower; (4) that skiagraphs, taken with a probe introduced into the lachrymo-nasal canal, are strongly to be recommended for the determination of the rhinogenous causes underlying the disease of the lachrymal passages.

BRYAN (350, **Submucous dacryocystorhinostomy for persistent dacryocystitis**) made a vertical incision in the mucous membrane and elevated it from the bone just in front of the anterior end of the inferior turbinate as far upward as the level of the lachrymal sac. The median bony wall of the sac was then removed by the curette. After making a hole in the flap of mucous membrane corresponding to the opening in the bone and sac, it was replaced and packing applied. The result was immediate relief from the purulent discharge, which had existed in this case since childhood and had resisted all other treatment. This operation had been suggested previously by others. ALLING.

XII.—ORBITS, EXOPHTHALMOS, ACCESSORY SINUSES. Reviewed by KRAUSS.

354. ALLPORT, F. **Removal of a spindle-cell sarcoma from the right orbit. Recovery with intact ocular apparatus.** *Ophthalm. Record*, July.

355. BEDELL, A. J. **Another case of chloroma.** *Annals of Ophthalm.*, July, 1912.

356. DUFAU. **Motor ocular troubles in sinusitis.** *La clinique ophtalm.*, vol. iv., p. 341 and 421.

357. HANSELL, H. F. **A case of œdema of the orbits, secondary to facial dermatitis.** *New York Med. Journal*, August 3.

358. HOLDSWORTH, F. **Orbital cellulitis with report of a case.** *Ophthalmic Record*, June, 1912.

359. JACQUEAU. **Acute meningitis after enucleation of the eye for post-traumatic phlegmon.** *Annales d'oculistique*, cxlviii., p. 195.

360. KLEYN, A. DE, and NIEUWENHUYSE, P. **The dangers of latent inflammations of the accessory sinuses.** *Nederl. Tijdschr. v. Geneesk.*, No. 7.

361. LEPLAT. **Unilateral external ophthalmoplegia with exophthalmos and tachycardia.** *La clinique ophtalm.*, vol. iv., p. 466.

362. RUEBEL, E. **Enlargement of the blind spot (van der Hoeve's symptom) and central scotoma in disease of the posterior accessory sinuses of the nose.** *Klin. Monatsbl. f. Augenheilkunde*, August, p. 130.

LEPLAT (361, **Unilateral external ophthalmoplegia with exophthalmos and tachycardia**) met with a condition of this nature in a woman 24 years old. Although other signs of exophthalmic goitre were absent, it was probably a case of this disease. Large doses of potassic iodide were given, the pareses of the ocular muscles and the exophthalmos retrogressed within two months, and the tachycardia completely disappeared. Wassermann's reaction was negative. From the behavior of the paretic sphincter pupillæ of the right eye, which showed a distinct reaction when the eye was turned to the left, but not when turned to the right, hence with the synergic activity of the internus which is likewise supplied by the oculomotorius, Leplat concludes that the paretic fibers may carry the impulse from the nuclear region of the internal rectus and perhaps also of the ciliary muscle.

CAUSÉ.

DE KLEYN and NIEUWENHUYZE (360, **Dangers of latent inflammation of the accessory sinuses**) give the clinical history of a man who had a fracture of the skull, the fissure passing through the frontal bone, the roof of the left orbit, the left sphenoidal sinus, the sella turcica, and the clivus. The patient had enophthalmos of the left eye. The right field of vision was island-like, the vision $\frac{4}{6}$; that of the left was reduced to a minute trace in the nasal periphery, vision $\frac{1}{300}$.

One month after the accident the patient died of purulent meningitis caused by an empyema of the sphenoidal sinus. At the autopsy the chiasm was found to be torn completely into two portions. The medial portion of the roof of the left orbit was displaced downward, the outer portion upward.

VISSER.

JACQUEAU (359, **Acute meningitis after enucleation**) saw a very acute meningitis with cellulitis of the orbit after enucleation of the eye because of a wound with a piece of iron. The enucleation was performed without delay on the day after the cellulitis of the orbit began; the next day meningitis set in and rapidly proved fatal. In spite of this case Jacqueau believes enucleation to be the best operation in commencing panophthalmitis, because recovery is more rapid than after any other procedure, and because it affords the patient greater security for the future. But if signs of commencing cellulitis are present, or if a florid panophthalmitis already exists, the operation of choice is exenteration with the cautery.

CAUSÉ.

ALLPORT (354, **Removal of a spindle-cell sarcoma from the right orbit**) removed three small encapsulated tumors from the upper nasal wall of the orbit through an incision similar to the Killian frontal sinus operation. There was perfect recovery from the exophthalmos, divergence, and normal vision.

ALLING.

BEDELL (355, **Another case of chloroma**) reports on a case already published which showed four tumors of the orbit and lids with proptosis, optic neuritis, and ophthalmoplegia. He also records another case—a female aged 18, in whom examination disclosed nodules attached to muscles and bones in the breasts. The blood count showed reds 2,200,000, whites 52,000. The right eye bulged 25*mm* with intense engorgement of the veins of the lid and temporal region. A tumor mass was present in the lid and extended deeply into the orbit. The cornea was completely unprotected and the conjunctiva chemotic. An autopsy was obtained and a complete pathological report is given.

ALLING.

Enlargements of the blind spot, van der Hoeve's symptom, and central scotomata play a very important part in th

diagnosis of diseases of the posterior accessory sinuses of the nose, while the behavior of the peripheral portion of the visual field furnishes no material aid in such cases. This is confirmed by four clinical observations made by RUEBEL (362, **Diseases of the posterior accessory sinuses of the nose**). His first case was one of bilateral empyema of the ethmoid cells, with a great enlargement of the blind spot for red and green of both eyes. A week after the opening of the left posterior ethmoid cells these symptoms had disappeared from both eyes, whence he concludes that each ethmoid is in connection with both optic canals. In the other three cases there was also a more or less marked central scotoma, or enlargement of Mariotte's spot, associated in the second case with a paresis of the accommodation. In this case all of the symptoms passed off after resection of the hypertrophic middle turbinate, which he regards as the cause of the optic nerve trouble. Quite trivial changes in the mucous membrane of the accessory sinuses may give rise to these symptoms, as is shown by the third case, in which they disappeared within two or three weeks after the opening of apparently normal ethmoid cells. In the fourth case there was a large, absolute, central scotoma that extended over the blind spot, which was itself considerably enlarged. This disappeared almost completely after the operative treatment of the basal disease. The outer margins of the visual fields remained normal in spite of the long continuance of the disease of the optic nerve.

DUFAU (356, **Motor ocular troubles in sinusitis**) says that the development of the clinical picture is apt to vary a great deal. Usually exophthalmos sets in rather suddenly with swelling of the lids and chemosis, spontaneous and pressure pain, elevation of temperature and visual disturbance, so that the diagnosis of a retrobulbar trouble may be made. The propagation of the pus takes place generally through the bone or through the veins. The diagnosis of sinusitis usually has to be made with the aid of a rhinologist, and the radical removal of the purulent focus should be made by him. In some cases the symptoms are extremely violent and death may occur from a diffuse meningo-encephalitis, or through a localized cerebral suppuration. The symptoms are almost

the same in ethmoiditis and in empyema of the frontal sinus. The abscess is situated in the inner-upper corner, above the tension of the orbicularis, and the place of perforation is almost always in the inner part of the upper lid, yet the perforation may take place into the lachrymal sac and the conjunctival sac. Empyema of the sphenoidal sinus is never found alone, it is usually caused by thrombophlebitis of the orbit, or by direct extension from the posterior ethmoidal cells. The first sign of a chronic inflammation of the maxillary sinus often is a swelling behind the lower lid which displaces the eyeball upward and so causes diplopia. The chronic form of frontal sinusitis is the mucocele, which must be differentiated from orbital periostitis and from a cystic empyema. Mucoceles of the ethmoidal cells present clinical symptoms that are similar, but are situated rather more deeply. In all of these cases there is a more or less marked exophthalmos, with displacement of the eyeball downward and outward in addition to the signs of sinusitis. The group of cases in which diplopia suddenly appears without any other symptoms is particularly interesting. As a rule, these are cases of empyema of the sphenoidal sinus. In general it may be said that an isolated disease of one sinus is a rarity in serious cases. In opening a retrobulbar abscess one should not be content with a simple incision, but should seek out the fistula leading to the diseased sinus and so avoid later sequelæ. In orbital complications the process in the orbit should first be attacked and then the diseased sinus should be treated, except that diseases of the maxillary sinus should be treated first. The nature of the intervention indicated depends on the sinus involved and the severity of the inflammation.

CAUSÉ.

HOLDSWORTH (358, **Orbital cellulitis**)reports a case showing marked exophthalmos from an inflammatory swelling of the orbital tissue. There was an ethmoiditis on the same side with the purulent nasal discharge. Orbital incision and exploration disclosed no pus, but a purulent discharge appeared in the wound two days later. No records of vision or of an ophthalmoscopic examination are given. After two months the eye was in a normal condition and the cosmetic result was satisfactory. ALLING.

HANSELL (357, **Œdema of the orbits secondary to facial dermatitis**) reports a case that very closely resembled one of facial erysipelas, except that the line of demarcation characteristic of that affection was not present. The left cheek was flushed and swollen, hard, not sensitive, and hotter than the forehead. The right cheek was affected in a similar manner, but to a much less degree. The left conjunctiva was puffy, folded as the eye turned in various directions, and was formed into a ridge by the closing of the lids. The œdema could be shifted about by pressure upon the lower lid with the finger. The eye was unaffected and the vision was good. Injections of streptococcic serum caused the dermatitis on the left side and the orbital œdema to become better promptly, but the increased swelling and infiltration of the skin and orbit on the right side proved that the disease itself was not favorably influenced thereby. No light was thrown on the etiology by examinations of the urine and blood. The symptoms subsided at the end of a week. With regard to the etiology of the condition, it was learned that the patient had resided the year before in northern Canada, where the temperature remained for five months at zero or below, and that the disease was epidemic there. It was attributed to the excessive cold and its sudden cessation, but its cause had not been ascertained.

FOSTER.

XIII.—CONJUNCTIVA. Reviewed by WOLFRUM.

363. ADDARIO, C. **The presence of Prowazek's bodies in the follicles and papillæ of trachoma.** *Annali di Ottalmologia*, fasc. 7.

364. ADDARIO, LA FERLA. **Prowazek's bodies.** *Ibid.*, fase, 6 and 7.

365. BERGMEISTER. **Multiple nævus tumors of the conjunctiva.** *Arch. f. Ophthalmologie*, vol. lxxxii., No. 3, p. 543.

366. COMNINOS and MARCOGLOU. **Chancre of the bulbar conjunctiva.** *Arch. d'ophtalmologie*, xxxii., p. 441.

367. DAVIS, A. E., and VAUGHAN, H. **Phlyctenular (eczematous) conjunctivitis and keratitis with special reference to etiology and the value of tuberculin as a diagnostic agent, together with the report of forty cases.** *Ophthalmic Record*, Sept., 1912.

368. KUTSCHERENKO, P. **Prowazek's bodies and their diagnostic importance.** *Russk. Wratsch*, 29, 1912.

369. MAY, CHARLES. **Treatment of trachoma with radium. The use of radium-covered plates for this purpose.** *Ophthalmology*, July, 1912.

370. RUDAS. **Pathology of the caruncle.** *Klin. Monatsbl. f. Augenheilk.*, September, p. 338.

371. SCHWARTZKOPF. **A small epidemic of conjunctivitis caused by the influenza bacillus.** *Diss.*, Rostock, 1912.

KUTSCHERENKO (368, **Prowazek's bodies**) was able to find Prowazek's bodies in only 25% of the cases of trachoma that he examined, but he found it in all forms of the disease, independently of its duration and treatment. In the initial stages they were present in about 6%, consequently their diagnostic importance at this time is not great. The size of the bodies, their varieties, their staining, and their existence in various diseases, all argue against their specificity. It is possible that the polynuclear leucocytes that penetrate into the epithelial cells play a considerable part in the formation of Prowazek's bodies as well as in the pouching of the epithelial cells, the destruction of the second nucleus in the cells with two nuclei, and the kinetic figures in the nucleus.

V. POPPEN.

ADDARIO (364, **Prowazek's bodies**) thinks that the intra- and extra-cellular globules of different sizes and almost spherical form, which have an affinity for the basic aniline colors, may not be of a parasitic nature and are of no great importance in the etiology of trachoma, as they are rare in acute cases and may be found in normal organs. The homogeneous appearance of these bodies, the changes in the nucleus and the cytoplasm of the cells, and the fact that they are met with more frequently in the degenerative stage of chronic trachoma, indicate rather that they are products of a hyaline-like degeneration of the cells.

CIRINCIONE.

The elementary or initial bodies of Prowazek exist, according to ADDARIO (363, **Prowazek's bodies**), in the tissue proper of the follicle and papilla of trachoma as well as in the epithelium. This deprives the theory of an epitheliosis of its foundation, and goes to support the idea that trachoma is a specific proliferation of the adenoid layer of the conjunctiva. In acute trachoma the inclusions are found in the epithelium; in the second stage of the disease they are found in greater numbers in the follicles and papillæ.

CIRINCIONE.

The work of SCHWARTZKOPF (371, **Conjunctivitis caused by influenza bacilli**) contains first a full account of the diseases of the eye that are produced by influenza bacilli, which includes not only conjunctivitis, but panophthalmitis and orbital cellulitis. The epidemic that he had an opportunity to observe was confined to 13 children in an almshouse, who came down with the disease almost simultaneously. The interpalpebral space was covered, especially near the inner canthus, with a thick, tenacious, greenish yellow secretion. The palpebral conjunctiva was moderately reddened. Influenza bacilli were found to be present not only by the examination of slides, but also by cultures.

DAVIS and VAUGHAN (367, **Phlyctenular conjunctivitis and keratitis**) in studying their cases used the Pirquet test for diagnosis and the tuberculin injections for therapeutic purposes. Twenty-eight reacted to the test, and in these only was the tuberculin used. Local treatment consisted of boric acid, yellow oxide, and atropine when indicated. Diet and hygienic surroundings were looked after; 65% were cured, 20% improved, 15% unimproved. They believe, as the result of their experience, that tuberculin should be employed in these cases as a diagnostic and therapeutic measure.

ALLING.

To the 26 cases already known of chancre of the bulbar conjunctiva COMNINOS and MARCOGLOU (366, **Chancre of the bulbar conjunctiva**) add another, that of a male 17 years old who came under observation about 3 months after the probable time of infection. In addition to the lesion in the inner-upper part of the bulbar conjunctiva there was an ulceration of the cornea and so great an opacity of the vitreous that the fundus could not be seen, while all the lymphatic glands in the neighborhood were much indurated. Perfect recovery with normal vision followed two injections of salvarsan within ten days. CAUSÉ.

RUDAS (370, **Pathology of the caruncle**) reports a case of soft fibroma of the caruncle which was as large as a hazelnut and prevented the closure of the lids. The structure of the tumor was found microscopically to be that of a fibroma. This is the fourth case reported.

BERGMEISTER (365, **Multiple nævus of the conjunctiva**)

describes a case of extensive melanosis of the conjunctiva with multiple pigmented tumors. The pigmentation affected especially the upper half of the conjunctiva and extended to the transition fold. The tarsal conjunctiva of the upper lid was thickened, velvety, and covered with masses of tumor, like paving stones, that extended deep into the tarsus. The lower lid was forced away from the eye by a tumor which protruded in its middle portion above the free margin of the lid and covered the lower third of the cornea. When the lower lid was drawn down and the patient looked upward, the tumor, as large as a cherry, was seen to spring from the conjunctival sac. The nasal commissure together with the plica and caruncle were involved in the tumor and stained a gray black. The orbit was exenterated and the lids removed. No recurrence had appeared at the time of writing. The tumor of the caruncle had a markedly sarcomatous character, but the others could not be classified as such; some of them resembled cylindromata, some endotheliomata. It is supposed that the melanosis of the epithelium preceded the formation of the tumors, and that, after the latter had occurred, it gave rise to an intense disease of the conjunctival epithelium and to the formation of tumors from the epithelial cells. In that case this was a combination of melanosarcoma and melanocarcinoma.

Numerous reports of excellent results by this method of treatment are recorded by MAY (369, **Treatment of trachoma with radium**). His own experience, however, with fifteen patients leads him to the conclusion that radium exerts a possible influence upon trachoma, but that eyes treated with sulphate of copper improved more rapidly, and that patients complained more of irritation from the radium than from the bluestone. ALLING.

XIV.—CORNEA AND SCLERA. Reviewed by WOLFRUM.

372. IWANOFF, M. **Treatment of pannus trachomatosus with electrolysis.** *Diss.*, St. Petersburg, 1912.

373. JOBSON, G. B. **Keratotomy for the removal of corneal scars and opacities.** *Ophthalmic Record*, July, 1912.

374. LACOMPTE. **A case of parenchymatous keratitis due to hereditary syphilis following linear extraction of cataract.** *Annales d'ocul.*, cxlviii., p. 183.

375. MAGITOT, A. **Transplantation of the human cornea previously preserved in an antiseptic fluid.** *Jour. Amer. Med. Assn.*, July 16, 1912.

376. MIGLIORINO. **Ring abscess of the cornea from general staphylococcic intoxication.** *Annali di Ottalmologia*, fasc. 7, 1912.

377. TAKAYASU. **Primary fatty degeneration of the cornea.** *Archiv f. Ophthalmologie*, vol. lxxxii., No. 3, p. 475.

A little girl had a dense infiltrate appear first in her left eye and then in her right, following a number of subcutaneous abscesses, according to MIGLIORINO (376, **Ring abscess of the cornea from general staphylococcic intoxication**). Recovery, leaving only a small leucoma on her left eye, followed the ordinary treatment together with injections of antistreptococcic serum. The writer believes this to have been a case of parenchymatous keratitis caused by intoxication through the aqueous. CIRINCIONE.

The disputed question whether the parenchymatous keratitis of hereditary syphilis can be excited by traumatism is raised again by the case reported by LACOMPTE (374, **Parenchymatous keratitis due to hereditary syphilis following linear extraction of cataract**). A girl 15 years old, who presented a history and unquestionable clinical signs of congenital syphilis, underwent a linear extraction for cataract in an otherwise normal eye. On the third day after the operation a typical parenchymatous keratitis appeared, starting from the wound. Three months later the other eye, which had been successfully operated on 7 years before, was attacked by the same disease. The three fundamental conditions demanded by Terrien for a traumatic parenchymatous keratitis, previous perfect integrity of the injured organ, unquestionable traumatism, and immediate connection in time between the traumatism and the disease, were all present in this case. Of the secondary demands, the one that one eye alone shall be affected is not present. It is also to be noticed that the patient was at the typical age for the development of a parenchymatous keratitis.

CAUSÉ.

TAKAYASU (377, **Primary fatty degeneration of the cornea**) describes two cases of spontaneous fatty degeneration of the cornea. Trachoma was present in both, but he does not consider that it had any causal connection with the corneal

trouble. White spots appeared on the cornea, which were at first small, but gradually increased in size. They were of various sizes, punctate, rod-shaped, and formed here and there a network. The opacities extended to a considerable depth into the parenchyma of the cornea, and were composed of minute fibers that radiated from their margins. Vessels extended from the margin of the cornea to the opacities. The cornea was of a dirty gray color. The trachoma was completely cured in both patients. Small pieces were excised from the affected portions of the cornea and examined microscopically. Abundant deposits of fat were to be seen, distributed most freely within the lamellæ, but present also in Bowman's membrane and in the basal cells of the epithelium. Bowman's membrane was destroyed in some places, greatly reduced in others. The author was able to find only one similar case on record.

JOBSON (373, **Keratotomy for the removal of corneal scars and opacities**) suggests dissecting off cicatricial tissue from the cornea until clear lamellæ are reached. He has operated on fifteen cases, but gives the results of only two, which were successful. The useless condition of an eye with deep corneal scars makes any reasonable method worthy of consideration, but the danger of infection, and the probability of recurrence of the opacities, call for further proof of the value of this procedure. ALLING.

MAGITOT (375, **Transplantation of the human cornea previously preserved in an antiseptic fluid**) employs hæmolysed blood serum from a different animal of the same species, and is able to preserve the eye with perfectly clear media at a temperature of 5° to 8° C. for fourteen days. To prove that the vital processes in the tissue are not destroyed, he resorted to transplantation of a section of the preserved cornea into an excavation made in the cornea of a live animal. These experiments were satisfactory. He has also performed one keratoplasty on the human subject. A boy was found with a large cicatricial pterygium, the result of a burn, and a cornea entirely opaque except for a small peripheral area. The vision was $\frac{1}{17}$. The corneal tissue for transplantation was obtained from an eye enucleated a week previously for absolute glaucoma and preserved in serum. The pterygium was

dissected off and the transplantation performed without suturing. After nearly a year the graft remained perfectly transparent, appearing like a window in the opaque wall, and the vision was $\frac{1}{7}$. If the ability to prolong the life of tissue is established, keratoplasty will find a wider field, since up to this time the experiments have been confined to transplantation from the fresh eye. ALLING.

In cases of grave trachoma IWANOFF (372, **Treatment of pannus trachomatosus with electrolysis**) has often obtained good results by means of electrolysis. In trachomatous pannus an electric peritomy is performed on the scleral conjunctiva, sometimes destroying at the same time the superficial vessels of the cornea. The strength of the current used for the peritomy should not be less than 2 milliamperes, nor more than 3. The sittings should not last longer than 3 or 4 minutes. For the cornea the current should be only 1 *m. a.*, and the time of touching each place not more than from five to seven seconds. In order to obtain the best effect in grave pannus, the sittings should be repeated in from three to seven days, after all the signs of reaction have disappeared. The disappearance of the vessels and of the opacity is accelerated decidedly by the electrolysis. In granular trachoma the granules may be caused to disappear without the formation of cicatricial tissue by electrolysis with knob-shaped electrodes, but this is of little help in deep infiltration and œdema of the conjunctiva. It is of good service in trichiasis by destroying the lashes. The current in these cases is from $1\frac{1}{2}$ to 2 *m. a.*, the sitting from 1 to $1\frac{1}{2}$ minutes long. Ordinary steel needles are better than those of platinum.

V. POPPEN.

XV.—IRIS AND PUPILS. Reviewed by NICOLAI.

378. BISTIS. **Paralysis of the sympathetic in the etiology of heterochromia.** *Arch. d'ophtalmologie*, xxxii., p. 578.

379. FEJER, J. **Aniridia congenita bilateralis.** *Zentralbl. f. prakt. Augenheilkunde*, August, p. 227.

380. HOENIG, A. **Hæmangioma simplex iridis ad marginem pupillæ.** *Ibid.*, August, p. 229.

381. NONNE. **Clinical and anatomical study of a case of isolated true reflex immobility of the pupil without syphilis in grave chronic alcoholism.** *Neurologic. Zentralblatt*, 1912, No. 1.

382. ROCHAT. **Deposits on the cornea in cyclitis.** *Nederl. Tijdschr. v. Geneesk.*, 1912, ii., No. 7.

383. SATTLER, C. H. **Vermiform twitchings of the sphincter pupillæ.** *Klin. Montasbl. f. Augenheilkunde*, September, p. 349.

384. STRAUB. **Cyclitis, deposits on Descemet's membrane, and cloudiness of the vitreous.** *Nederl. Tijdschr. v. Geneesk.*, 1912, i., p. 125.

385. TOCZYSKI, F. **The influence of dionin upon the pupil and tension of normal eyes.** *Zeitschrift f. Augenheilkunde*, July, p. 32.

386. WESTPHAL, A. **Another contribution to the pathology of the pupil.** *Deutsche med. Wochenschrift*, 1912, No. 38.

After a compilation of the published cases of heterochromia connected etiologically with paresis of the sympathetic, BISTIS (378, **Paralysis of the sympathetic in the etiology of heterochromia**) describes the case of a woman 38 years old, delicate but otherwise in good health, in whom a normal fundus had been found at a previous examination for glasses. The heterochromia had appeared two years before, coincidently with ptosis, meiosis, enophthalmos, and atrophy of one side of the face. The left iris was brown, but the right was gray blue, with slightly obscured markings and a little atrophy. In addition there were deposits on the posterior surface of the cornea and an insufficient dilatation of the pupil to cocaine. Probably, because of the coincident neuralgia of the trigeminus, there existed, together with the affection of the cervical sympathetic, a similar trouble of the sympathetic ganglia in the head. CAUSÉ.

FEJER'S (379, **Aniridia congenita bilateralis**) case is interesting because of the good vision of the patient, almost $\frac{5}{10}$. The man was able to do good work as a cobbler and did not suffer from dazzling. Small striated opacities could be seen in the lens. Nothing could be seen of the mechanism of accommodation, advance of the ciliary processes, and reduction of the space about the lens, even with eserine. No traces of the irides could be seen. The refraction was between 3 and 4 D. of myopia without astigmatism.

HOENIG (380, **Hæmangioma simplex iridis**) saw a little triangular hæmatoma, looking like three little red berries, near the margin of the left iris of a man 47 years old. Such hæmangiomata are rare, although the iris is predisposed to the formation of tumors of various kinds because of its vascularity. Vision was reduced to $\frac{5}{50}$ by corneal opacities.

STRAUB (384, **Cyclitis, deposits on Descemet's membrane, and cloudiness of the vitreous**) ascribes the cloudiness of the vitreous to an accumulation of leucocytes induced by toxines. It is to be seen in both the syphilitic and the tuberculous forms of the disease. He also ascribes the swellings of the papilla, the tubercles at the pupillary margin of the iris, and the delicate deposits on Descemet's membrane to the action of toxines.

ROCHAT (382, **Deposits on the cornea in cyclitis**) examined these deposits in two eyes enucleated on account of tuberculous cyclitis. The smallest, most recent deposits are heaps of round cells upon intact endothelium. They sink in the aqueous from their own weight and adhere to the cornea. They increase in size by agglutination, perhaps under the influence of bacterial toxines and through proliferation of the endothelial cells. VISSER.

SATTLER (383, **Vermiform twitchings of the sphincter pupillæ**) finds that the vermiform twitchings of the iris sometimes occur in normal eyes, and that they are particularly distinct when the pupils react slowly or not at all. The explanation of the phenomenon given by Muench, that in weak illumination weak currents of innervation for the adaptation of the retina are able to excite only individual segments of the sphincter, is not applicable to all cases.

NONNE (381, **Reflex immobility of the pupil in chronic alcoholism**) saw a clearly defined reflex immobility of the pupil, with a slight mydriasis, in an alcoholic 51 years old. There were no signs of either syphilis or tabes. No traces of syphilis could be found on autopsy. This is a rare case, for this pupillary phenomenon is almost never observed to be due to toxic influences.

WESTPHAL (386, **Pathology of the pupil**) reports three interesting cases. 1. A woman was attacked by migraine, at first occasionally but later chronically, associated with mydriasis and absolute immobility of the pupils after cessation of her menses. She had other vasomotor disturbances. The case was one therefore of a periodic condition in the oculomotor region resembling paresis, in which only the pupillary branch was involved. A similar pupillary condition that alternates with a normal, is met with in katatonia. It

is difficult to explain the symptoms; vasomotor disturbances and psychic influences certainly play a part. 2. A patient with no signs of tabes, syphilis, or general paresis, in whom a dilatation of the pupil to light preceded a minimal partial contraction that was visible microscopically. This is apparently a case of paradoxical light reaction. In such cases attention should always be paid to the partial minimal changes with the aid of the loupe, and the peculiar action of the muscles of the iris should be studied. 3. A patient with manic conditions of excitement showed a pupillary reaction very like the neurotonic. The pupil contracted to light and then remained in a condition of spastic neurosis until it began to dilate gradually after the room had been darkened.

TOCZYSKI (385, **Influence of dionin upon the pupil and tension**) says that the pupils usually contract at first and afterward dilate. The contraction takes place at the same time as the chemosis. The dilatation is not constant. The tension is elevated at first, but later returns to or falls below normal. There appeared to be no constant relation between the pupil and the tension.

XVI.—LENS. Reviewed by NICOLAI.

387. ELSCHNIG. **Treatment of senile cataract.** *Med. Klinik*, No. 27.
388. ROEMER. **Pathogenesis of cataract.** *Berl. Ophthalm. Gesellsch.*, July 17, 1912.
389. WIEDERSHEIM, O. **Expulsive hemorrhages after cataract extraction.** *Inaug. Diss.*, Stuttgart, 1912.

ROEMER (388, **Pathogenesis of cataract**) found in the blood serum of a young person with diabetic cataract substances which were able to rapidly break down lens albumin with the production of toxic products of metabolism. These are not found in the same concentration in normal human blood serum. KOELLNER.

ELSCHNIG (387, **Treatment of senile cataract**) says that the prevention of senile cataract lies in the treatment of diathesis, sclerosis, and metabolic changes, while a limit can scarcely be given to the operative treatment. All ages are suited to the operation, and even diabetics with little sugar may be operated on. A postoperative iritis is generally due to infection, so he recommends thorough irrigation of the

conjunctival sac with a solution of oxycyanate of mercury. A round pupil is ideal. Prolapse of the iris is best avoided by excision of a piece of the iris at its base. Iridectomy is indicated in cases of general diseases, prominent eyeballs, and unruly patients. The incision at the margin of the cornea should be covered by a conjunctival flap.

One of the most unfortunate complications of extraction of cataract is the expulsive hemorrhage, but luckily it is not very common. According to the statistics compiled by WIEDERSHEIM (389, **Expulsive hemorrhage after cataract extraction**), the figures vary from 1.1% to 0.04%. The causes are changes in the blood-vessels, associated with the fall of tension when the eyeball is opened, and some other factors, such as loss of vitreous. The hemorrhage is usually arterial, seldom venous, chiefly from the ciliary arteries. Therapeutically absolute rest, a pressure bandage, compresses of ice, ergotin, morphine, and injections of gelatine may be employed, but finally comes enucleation.

XVII.—VITREOUS. Reviewed by KÜMMELL.

390. MAGITOT and MAWAS. **The development of the human vitreous and zonule.** *Annales d'oculistique*, cxlviii., p. 179.

MAGITOT and MAWAS (390, **Development of the human vitreous and zonule**) divide the development of the vitreous and zonule into three stages: the primary, the transitory, and the final vitreous. The vitreous is an ectodermal formation coming from the neuroglia. Its first rudiment consists of a fibrillary proliferation of the basal fibres in the marginal zone of the embryonal retina. Up to the seventh week the lenticular vesicle takes part in its formation by thread-like processes from the lenticular cells. As early as the beginning of the fourth week the hyaloid system of vessels, formed from mesodermal elements, appears in the secondary optic vesicle and extends quickly to the orbit; these elements are confined wholly to the formation of vessels. Toward the end of the eighth week appears centrally the "transitory" vitreous, surrounded by the hyaloid vessels as by a sheath, composed of a transiently existing proliferation of the ectodermal neuroglia of the optic nerve, coming from the papilla. It reaches its maximum at the end of the third month and is then re-

placed by the retinal secretion. The final vitreous results from the redevelopment of the primordial, which sets in briskly with the fourth month. At this time the ciliary body is differentiated and the rudiments of the ora serrata are present; from this time on these two assume the principal part in the formation of the vitreous. Mueller's cells grow into a dense, delicate plexus that fills the interior of the eye. The most anterior fibers are inserted into the capsule of the lens and so form the zonula. There is no central canal and no hyaloid membrane. The vitreous and zonula are formed from neuroglia which is adapted to the optical purposes.

CAUSÉ.

XVIII.—CHORIOID. Reviewed by KÜMMELL

391. ALT, ADOLPH. **Microscopical examination of the eye in the case of chorioidal tumor reported by Dr. Green.** *Am. Jour. of Ophthalm.*, June.

392. GREEN, JOHN, Jr. **Sarcoma of the chorioid.** Unusual clinical features. *Ibid.*, June.

The case of sarcoma of the chorioid reported by GREEN and examined by ALT (391 and 392, **Sarcoma of the chorioid**) is of some interest because the patient's attention was first called to the trouble in his eye during an attack of pertussis. Green thinks that prior to the attack of pertussis a minute paramacular growth had slightly separated the overlying retina, and that during a severe coughing spell the separation suddenly became more extensive, though still sharply limited to an area corresponding to not more than two disk diameters. The tumor then enlarged very slowly without occasioning any greater degree of retinal detachment. A subretinal hemorrhage then appeared, and finally a mass could be seen projecting into the vitreous. The eye was enucleated and the tumor was found by Alt to be a sarcoma confined to the macula and permeated with hemorrhages.

GILBERT.

XIX.—SYMPATHETIC OPHTHALMIA. Reviewed by KÜMMELL.

393. COPPEZ. **A case of sympathetic ophthalmia.** *Arch. d'ophtalm.*, xxxii., p. 591.

394. KOMOTO. **Deafness in sympathetic ophthalmia.** *Klin. Monatsbl. f. Augenheilkunde*, August, p. 129.

395. WEEKERS. **Pseudo-sympathetic ocular neurosis.** *Arch. d'ophtalm.*, xxxii., p. 409.

396. WISSMANN. **A contribution to sympathetic ophthalmia.** *Klin. Monatsbl. f. Augenheilkunde*, September, p. 367.

WISSMANN (396, **Sympathetic ophthalmia**) describes a case in which the outbreak of sympathetic ophthalmia took place 26 years after the injury.

COPPEZ (393, **Sympathetic ophthalmia**) reports a case of penetrating wound in the sclero-corneal region in which he did not perform enucleation, as is his custom. Treatment consisted of, in addition to local remedies, Heurteloup's leech, inunctions of mercury, the use of salicylic acid and pilocarpine, and subconjunctival injections. An injection of salvarsan was of no benefit. The wounded eye retained a vision of 0.4, the other one of 0.7. Coppez emphasizes the fact that wounds of the ciliary region are especially prone to induce sympathetic ophthalmia. Deep lime burns of the cornea and iris likewise may easily excite this disease. Injection of the papilla and peripapillitis frequently precede the inflammatory changes in the iris and ciliary body. Enucleation is necessary, even when the wounded eye still retains the power of vision. CAUSÉ.

WEEKERS (395, **Pseudo-sympathetic ocular neurosis**) designates as a pseudo-sympathetic neurosis a symptom-complex that he has observed in four cases. With no signs of irritation of the eye that had been injured, and even when this had been enucleated long before and no stump sensitive to pressure could be found in the empty orbit, these patients complained of impairment of vision of the healthy eye, of concentric or partial contraction of the visual field, of photopsias, in short of purely functional, psychic disturbances, which were usually almost completely relieved by suggestive treatment. Beyond doubt this was a neuropathic disease and not a sympathetic affection. The question of sympathetic irritation, and of sympathetic amblyopia, is still much debated. Under the latter name sympathetic retrobulbar neuritis and neuro-retinitis sympathica have been described. An amblyopia may be supposed to be sympathetic only when the injured eye is in a state of irritation, when the sympathizing eye shows no objective lesion, and when the possibility of a pseudo-sympathetic neurosis can be excluded with certainty.

CAUSÉ.

KOMOTO (394, **Deafness in sympathetic ophthalmia**) reports the following case. Wound of an eye by a splinter of wood with prolapse of the iris. Recovery prompt at first. Reprolapse of the iris about four weeks after the injury, with marked signs of inflammation of the iris. Exudate in the anterior chamber. Rise of temperature to above 38° C., with slowing of the pulse. Six days later sympathetic inflammation of the other eye, serous iritis, with severe headache, and on the ninth day almost total deafness with some slight disturbances of consciousness. After enucleation of the injured eye the general symptoms disappeared, but the sympathizing eye and the deafness, which was of cerebral origin, did not materially change. Later the deafness passed away. Deafness appears in these cases almost always without preliminary symptoms, sometimes accompanied by headache and delirium. The prognosis is bad, but two recoveries are recorded, this one and a case reported by Sachs. Only seven cases in all have been reported. Enucleation is of the most beneficial influence, yet the deafness persists for some months. Perhaps it may be due to an extension of the inflammation, that proceeds along the pial sheath of the optic tracts of conduction, to the auditory nerve, but the supposition that there is a slight meningitis seems to be more probable. The deafness is still more easily explained as metastatic, and similar to the diseases of the labyrinth met with in syphilis, mumps, and other infections.

XX.—GLAUCOMA. Reviewed by KÜMMELL.

397. DUTOIT. **Experiments with the internal treatment of glaucoma with iodine.** *Zeitschrift f. Augenheilkunde*, August–September, p. 131.

398. GILBERT. **Pathology, pathogenesis, and treatment of glaucoma.** *Archiv f. Ophthalmologie*, vol. lxxxii., 3, p. 389.

399. SHUMWAY, E. A. **Secondary glaucoma in interstitial keratitis, with report of a case.** *Annals of Ophthalmology*, July, 1912.

400. STRANSKY. **Anomalies of the scleral tension.** Vol. i. Glaucoma inflammatorium, the aged eye, scleral scars, glaucoma simplex. Leipsic and Vienna. F. Deuticke, 1912.

401. WICHERKIEWICZ. **Crucial posterior superficial sclerotomy.** *Annales d'oculistique*, cxlviii., p. 1.

GILBERT (398, **Pathology, pathogenesis, and treatment of**

glaucoma) points out that no indication of the form of glaucoma present can be found in the height of the tension; that it is often higher in simple than in inflammatory glaucoma, so that much can be said against Heerfordt's division into lymphostatic (glaucoma simplex) and hæmostatic (glaucoma inflammatorium) forms. Among other things the influence exerted by the refraction is considerable. In 186 cases he found hypermetropia in 38% of simple, and 77% of inflammatory glaucoma, while myopia was present in 31% of the former and in only 12% of the latter. The age of the patients varies in the different forms. It was between 30 and 60 years in 50% of the cases of inflammatory glaucoma, but in only 36% of those of simple; hence the inflammatory variety is met with more often in hypermetropic eyes and in younger persons than the simple. Tonometry, the visual fields, and the measurement of the blood pressure are efficient aids in the differential diagnosis, especially in the early stages. The author then passes to the connection with general diseases, especially those associated with an increase of the blood pressure. He could not demonstrate an increase in the adrenalin contained in the blood, as claimed by Kleczkowsky. He does not agree with Bjerrum in thinking that inflammatory glaucoma is a true inflammation produced by a very problematic morbid agent. On the contrary, he regards as the cause of the intraocular increase of tension a general circulatory disturbance associated with an increase of the blood pressure which leads to increased transudation in connection with local vascular disease, increase of the capillary pressure, and venous engorgement. The blood pressure is generally higher in inflammatory than in simple glaucoma. In the latter the tension is relatively independent of the blood pressure. The eye that is not hypermetropic with glaucoma simplex can adapt itself to a high blood pressure without any considerable increase of tension. Yet high tension may occur in glaucoma simplex with a low blood pressure as the result of local vascular changes. Therapeutically he recommends reduction of the blood pressure. The tension in inflammatory glaucoma may be temporarily reduced from 25 to 50*mm* by venesection; the decrease is less in glaucoma simplex. Venesection is indicated in the prodromal stage, in inoperative glaucoma

simplex, after operation in every form of glaucoma, and finally to reduce tension before operation. After the blood pressure has been reduced in this manner the intraocular tension falls, to rise again when the former has again increased. Dietetic treatment of the fundamental cause, the vascular disease, must also be undertaken. Meiotics usually produce a somewhat greater reduction of tension than venesection, but their effects quickly pass away. Pilocarpine and dionin reduce the tension strongly and quickly. Subconjunctival injections of sodium citrate gave bad results in two cases. Iridectomy regulated the tension in inflammatory glaucoma for a period of from 1 to 2½ years in only 4 out of 16 eyes; in the other an increase of tension reappeared sooner or later. Iridotasis reduced the tension quickly and permanently in 14 eyes with simple and inflammatory glaucoma, but this method has several technical faults. A comparison of the effects produced by iridectomy and iridotasis with those obtained by venesection shows that the operations reduce the tension better and more permanently, yet the cases that respond badly to venesection have a bad prognosis as regards the results of operation. He operates as quickly as possible in an acute attack, but only in the prodromal stage of simple glaucoma when prolonged freedom from prodromata cannot be obtained by venesection. Regarding the bad results of operation he often finds, after iridectomy, cyclodialysis, sclerectomy, scleral trephining, and iridotasis, a rapid loss of function, both of the central and of the peripheral vision. We must therefore proceed as carefully as possible therapeutically in glaucoma simplex and not seek unconditionally to reduce the increased tension.

STRANSKY (400, **Anomalies of the scleral tension**) calls attention to a point that has been overlooked many times, the involvement of the sclera in the so-called tension of the eye, the resistance of the globe measured with the finger or the tonometer, and brings out the individual factors which work together to create the resistance of the globe, the internal pressure, the hardness, rigidity, and tension of the sclera, as well as the way in which these work together. He believes that in age the resistance of the globe increases, while the tension of the sclera diminishes, so that the elderly eye is smaller

on the average, and hence the circumlental space is contracted and the diaphragm, composed of the lens and iris, is pushed forward. Under pathological conditions, an increase of resistance analogous to this to a certain degree physiological increase may take place in consequence of a simple chronic inflammation, and Stransky is convinced that the nature of the so-called simple glaucoma is not an increase of tension, but a chronic inflammation of the sclera which leads to an increase of the scleral resistance through a new formation of connective tissue, and thus to an elevation of the resistance of the globe which can be detected by palpation. He would substitute for the name glaucoma simplex that of "scleritis indurativa." The condition known as glaucoma simplex without increase of tension, or, by Horstmann, with amaurosis and excavation of the optic nerve, he calls scleritis indurativa postica, while the term scleritis indurativa antica is used to designate a condition of increased resistance of the globe and hyperæmia of the anterior ciliary vessels. When the scleritis indurativa involves all parts of the capsule of the eyeball, producing glaucoma simplex with increase of tension, the name used is scleritis universalis. After describing the symptomatology of scleritis indurativa and the new formation of connective tissue found in the sclera, he passes to the sequelæ of this form of inflammation, the change in the form of the eyeball and of the lamina cribrosa. Indurative scleritis involves the lamina and causes in it a new formation of connective tissue. The author tries to show that the intraocular pressure extends behind the lamina through the layers of fluid between the nerve fibers and the bundles of the lamina, so that the latter is subjected to the same pressure in front and behind, and that consequently there can be no "pressure excavation." He explains the outward bulging of the lamina as due to the contraction of the foramen scleræ together with an enlargement of the surface of the lamina by an increase in the number of its connective-tissue elements. The production of atrophy of the optic nerve by the pressure of the lamina upon the sheaths of myelin, and the differentiation between scleritis indurativa and acute glaucoma can only be mentioned. Finally he deals with the predisposition of eyes that are senile and that are

affected by scleritis indurativa to inflammatory glaucoma, and with a combination of these two diseases.

DUTOIT (397, **Internal treatment of glaucoma with iodine**) agrees with the majority of modern writers that arteriosclerosis is of considerable importance in the origin of glaucoma, and that the prophylaxis of the latter disease is the same as the treatment of the former, while operation is usually indicated when glaucoma has actually appeared. The signs of the "présclérose," of the just preceding condition caused by sclerosis, are mainly demonstrable clinically in the increase of the blood pressure and the changes in the cardiac action not due to rigidity of the vessels or to albuminuria. Among these are tortuosity of the subconjunctival veins, together with thickenings of their walls, and similar changes in the vessels of the iris, retina, and chorioid. We do not know with perfect certainty the details of the connection between the vascular disease and glaucoma; the exciting factor indeed is still unknown, yet we find clinically all transition stages from latent sclerosis with fluctuations of the blood pressure and of the intraocular tension with cardiac troubles without glaucoma on the one hand, to true glaucoma with the same or greater general symptoms on the other. As regards the value of treatment with iodide of potassium of the fundamental disease, he reports several cases of latent vascular sclerosis and changes predisposing to glaucoma which remained for years free from glaucoma, or from an increase of the general sclerotic disturbances. Benefit from the same treatment can be obtained even when the glaucoma has already appeared, though naturally only to a certain degree. Small doses, 1.5 to 3.0 daily, are recommended to be taken for years.

WICHERKIEWICZ (401, **Crucial posterior superficial sclerotomy**) recommends in simple or hemorrhagic glaucoma to lay bare the sclera, to make from 4 to 6 superficial, parallel incisions in a meridional direction in it, and then the same number in a direction vertical to the former. When the tension is much elevated, one of the meridional incisions may be made down upon the chorioid for a distance of 3 or 4*mm.* An important part of the after-treatment is that the eye be massaged for about ten days. He gives the clinical his-

tories of 17 cases of various forms of glaucoma successfully treated in this manner. In particular he claims that the operation is devoid of danger. Possibly it might be of good service also in keratoconus and keratoglobus.

CAUSÉ.

Changes in the intraocular pressure during the course of interstitial keratitis have long been observed. Softening of the eye, according to v. Graefe, is not uncommon. Increased tension is very rare. It occurs late in the disease and at times only after years. SHUMWAY (399, **Secondary glaucoma in interstitial keratitis, with report of a case**) cites a typical case of interstitial keratitis which had been under observation for six years. During this period the patient had suffered from three attacks of inflammation. After a year's freedom from trouble he noticed in December, 1911, that the eyes were congested and that the vision had failed. In the following February the tension was found to be increased and the optic disks to be cupped. The Lagrange operation was performed in each eye. There are two causes for the glaucoma. It may be secondary as the result of the occlusion of the pupil accompanying the iritis, or it may be caused by increase of the albumin in the aqueous, or to pathological changes at the iris angle. ALLING.

XXI.—RETINA. Reviewed by MEYER.

402. ADAM. **Anatomically displaced macula lutea.** *Transactions of the Berlin Ophthalmological Society*, July 17th.

403. BEGLE, HOWELL L. **A clinical report of three cases of retinitis circinata.** *American Journal of Ophthalmology*, September, 1912.

404. BETTTREMIEUX. **Technique and mode of action of the operations recently proposed for detachment of the retina.** *Annales d'oculistique*, cxlviii., p. 123.

405. COPPEZ. **Ocular complications of hypertrophic osteitis deformans.** *Archives d'ophtalmologie*, xxxii., p. 529.

406. GROES-PETERSEN. **Retino-chorioiditis (Edmund Jensen).** *Clinische Monatsbl. f. Augenheilkunde*, August, p. 159.

407. LASAREPF. **Three cases of hole-like defects in the macula lutea produced by the direct action of the sun's rays, and a similar case of traumatic origin.** *Westnik Ophthalmol.*, July, 1912.

408. NUEL. **Spotted degeneration of the macula lutea.** *Archives d'ophtalmologie*, xxxii., p. 465.

ADAM (402, **Anatomically displaced macula**) demonstrated

a peculiar anomaly that apparently has not been hitherto observed. A student came to him with a strabismus divergens and sursumvergens of about 10° to 15°. When the squinting eye was forced to fix, it remained in its strabismic position, and yet, in spite of the excentric fixation, the vision was perfectly normal. Examination with the ophthalmoscope revealed that the macula lutea was situated upward and outward from the papilla, so that the patient was in fact fixing on his macula. The distribution of the retinal vessels also was unusual, in that the lower part of the retina was almost free from the larger branches. Some white bands, possibly of connective tissue, extended from the papilla to the macula. Stereoscopic vision was not present. When the patient wished to lose sight of a mark in the blind spot the line connecting the mark and the point of fixation had to be vertical instead of horizontal. KOELLNER.

BEGLE'S (403, **Three cases of retinitis circinata**) report includes one typical and one incipient case, together with a third that was complicated by patches of pigment and glaucoma. All of the patients presented incipient cataract and general arteriosclerosis, but only slight changes in the retinal vessels and no hemorrhages. GILBERT.

BETTREMIEUX (404, **Detachment of the retina**) describes the technique and mode of action of the more recent operations for detachment of the retina. He considers sclerectomy to be the best procedure, as he has obtained favorable results in quite a number of cases with it. In many of them the operation had to be repeated two or three times. On the ground of the observation that the aqueous escapes under high pressure in iridectomy, he explains the action of sclerectomy to be that by it new anastomoses are opened between the deep and the superficial plexuses of vessels which render the conditions more favorable for the intraocular change of fluid. The formation of these new anastomoses can be followed with the binocular loupe. He does not consider Lagrange's cauterization of the pericorneal outer layers of the sclera to be any better than simple sclerectomy. CAUSÉ.

COPPEZ (405, **Ocular complications of hypertrophic osteitis deformans**) observed the appearance of little yellowish patches

of degeneration in the maculæ of four patients suffering from Paget's disease. These patches caused more or less extensive central or paracentral scotomata; frequently they formed by confluence a large atrophic spot, and they were often accompanied by punctate hemorrhages. All of the patients were old and presented arteriosclerotic and neuro-arthritic symptoms. Probably the lesion in the macula is caused by the same unknown agent as the bone disease. In one case diplopia was due to displacement of the trochlea by the osteitis. All of the patients had incipient cataract, but this was operated on in only one. No treatment is known.

CAUSÉ.

GROES-PETERSEN (406, **Jensen's retino-chorioiditis**) reports 15 cases of retino-chorioiditis, which is so well characterized that he considers it should be known, from the author who first described it, Jensen's retino-chorioiditis. Its characteristic seat is near the healthy papilla of one eye. Small hemorrhages are to be found in the retina. The patients scarcely note the defects present in the visual field, which are, according to the writer, radial defects in the layer of nerve fibers caused by compression. They are stationary and sharply defined. The disease has a decided tendency to recurrence, which always takes place in the old situations. Floating opacities appear in the vitreous. The vision of the patients is disturbed only for as long as the opacities are present, therefore the prognosis is good. In many cases the size of the patch is marked in comparison with the little defect.

LASAREPF (407, **Holes in the macula**) observed three cases of injury in the fundus produced by the direct rays of the sun. In the first case there was a red disk in the macula with about it a narrow ring of grayish white, cloudy retina. Distinct yellow points could be seen on the red surface. There was a well marked central scotoma; vision 0.3 or 0.4. The visual field and the color sensation were normal. The refraction was emmetropic. Otherwise the eye showed no changes; the right eye was normal. In the second case the patient complained of a slight cloud in front of his left eye and a dark spot in front of his right. The ophthalmoscopic picture within his right eye was quite identical with that in the preceding case, except that the diameter of the defect

was less than half a papilla, and that the parallactic signs were weaker. In the third case the hole in the macula was larger, equal in diameter to half the papilla. In the fourth case the retina at the posterior pole, including the macula, was cloudy as the result of a traumatism, allowing the red point in the center of the macula to be seen very well, together with a second dark red area with its longer diameter vertical, about the size of half a papilla, with sharply defined margins. Parallactic movements could not be made out at first, but were plainly visible after a couple of days. The scotoma was absolute. Evidently this was a simple laceration of the retina, while in the other, non-traumatic, cases a necrosis took place of the central and thinnest part of the macula.

V. POPPEN.

NUEL (408, **Spotted degeneration of the macula**) had the opportunity to examine anatomically one of these rare cases. The disease usually appears in elderly, arteriosclerotic persons, appears simultaneously in both eyes, producing a great impairment of the vision and a central scotoma, without any change in the peripheral portion of the field. It is not common for improvement to appear in the course of the disease, yet it does not cause total blindness. In the macula, which is the sole seat of the disease, appear a large number of small, roundish, yellow-red spots with indistinct margins, while the rest of the fundus remains normal, as a rule, except for a paleness of the temporal side of the papilla, which appears later. A certain torpor of the retina is characteristic. A homogenous exudate is formed between the vitreous lamella of the chorioid and the pigment epithelium, and becomes thickened in various places so as to give rise to the clinically visible roundish nodules. Above and below this layer of exudate with its nodules, the pigment epithelium and vitreous lamella are normal. The exudate is probably a chorioidal product. The picture resembles that of the colloid deposit on the vitreous lamella, except that the degenerative changes in the latter are slow, isolated, and may be observed in the periphery of the fundus. The disease is not traumatic as it is met with in eyes that have not been injured.

CAUSÉ.

XXII.—OPTIC NERVE AND VISUAL TRACT. Reviewed by MEYER.

409. DUCAMP. **A case of familial retrobulbar neuritis.** *Annales d'oculistique*, cxlviii., p. 48.

410. HARNACK, E. **Acute blinding by methyl alcohol and other poisons.** *Muenchener med. Wochenschrift*, No. 36, p. 1941.

DUCAMP (409, **Familial retrobulbar neuritis**) reports the cases of two sisters, 20 and 28 years of age, both of whom suffered from retrobulbar neuritis, and describes the condition as one of familial retrobulbar neuritis, probably due to hereditary syphilis. A perfect cure was obtained in the younger sister by an energetic mercurial treatment, while in the elder, in whom the disease was the more grave, the Wassermann reaction, which was positive at first, became negative in the course of the treatment. A central scotoma with disturbance of the color sense persisted in each eye of this sister. CAUSÉ.

HARNACK (410, **Acute blinding by methyl alcohol and other poisons**) comes to the following conclusions: Of the substances which can cause acute toxic blindness, methyl alcohol, nitrous acid, and atoxyl, which are otherwise so different, have one factor in common, that they produce their effects by the oxidizing action of the oxygen in the nervous elements of the eye. The blindness is due to acute, inflammatory degenerative processes in which these nervous elements are involved. With other poisons, on the contrary, such as quinine, cocaine, and probably filix mas, the acute blindness is produced in quite a different way, by a severe spasm of the retinal vessels, which may lead to obliteration of the vessels and consequent atrophy of the nervous elements, just as in embolism of the central artery.

Fig. 3.

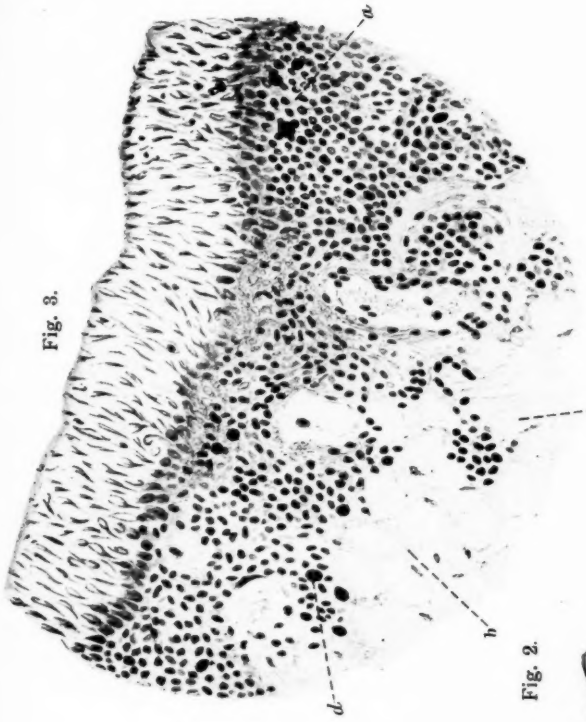


Fig. 2.

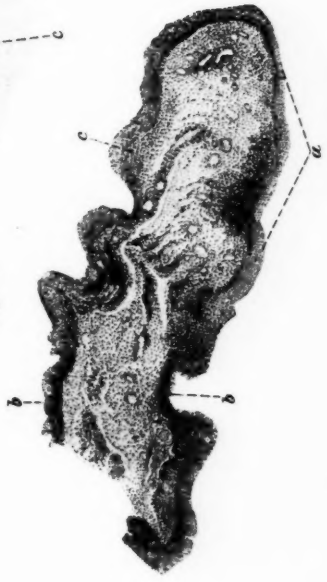
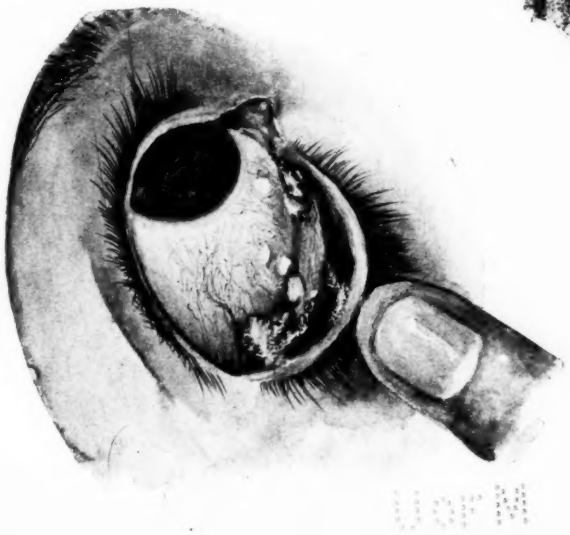


Fig. 1.



Falchi, Ophthalmie in Form von Bindehautflecken.

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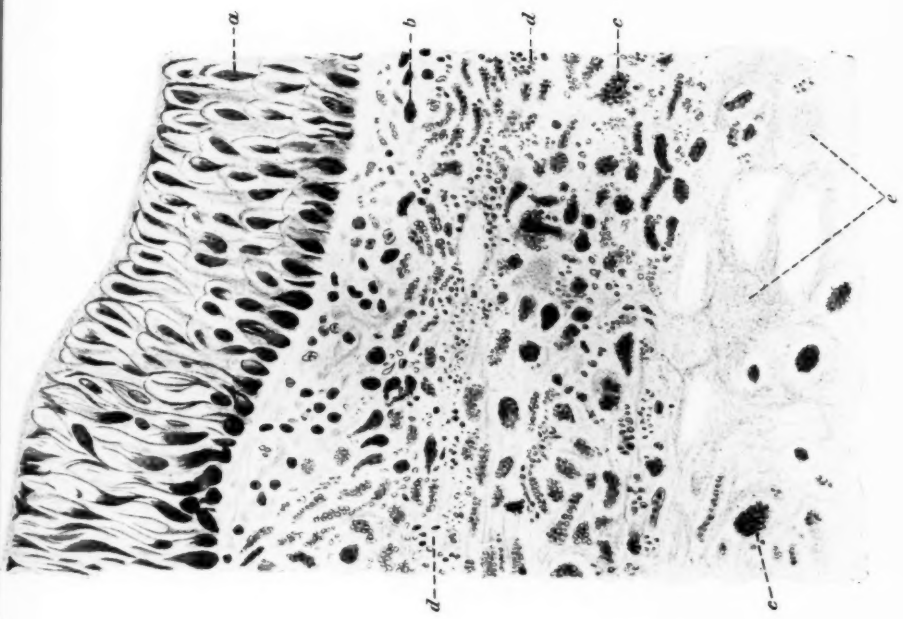

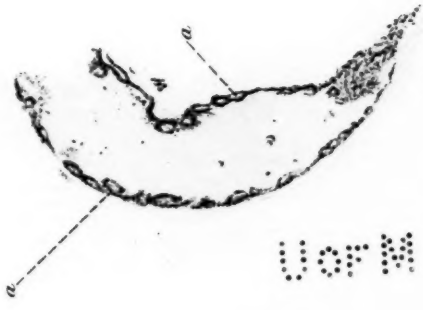

Fig. 5.

alchi, Ophthalmie in Form von Bindehautflecken.

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